

FEBRUARY 29, 1936

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Railway Age

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Looking Forward to a Good Railroad Year

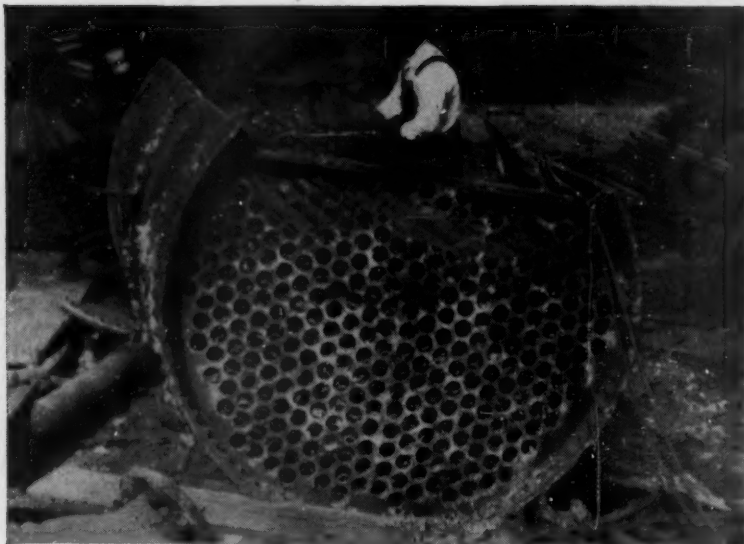
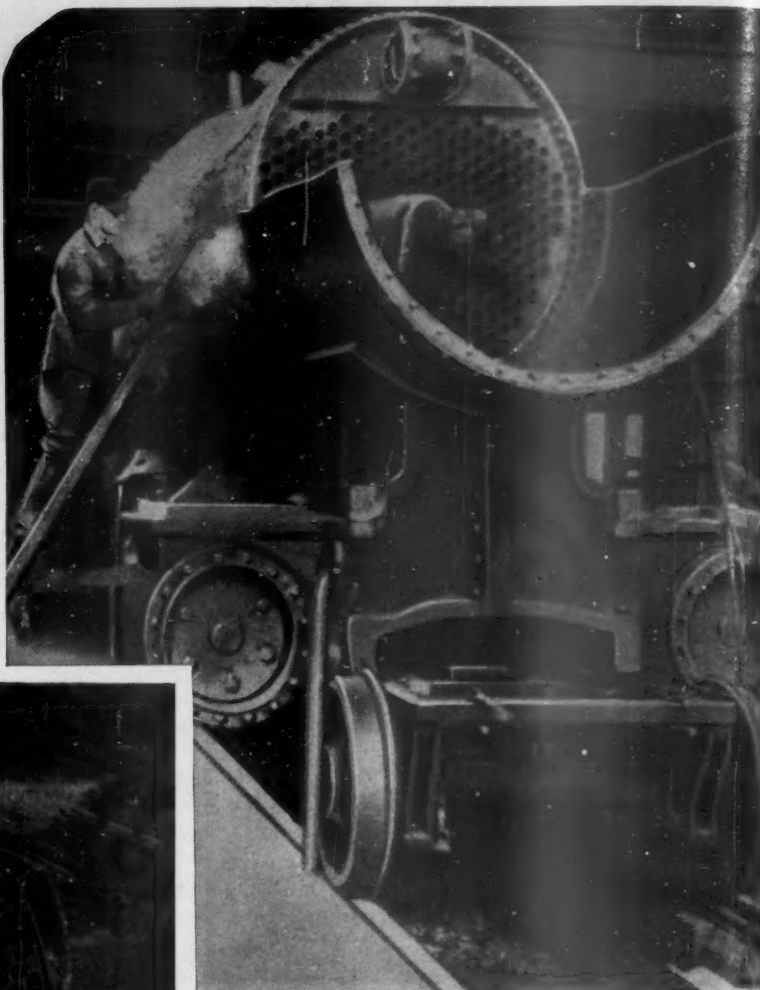
IN the first seven weeks of this year 289,000 more cars of freight were loaded than in the like 1935 period. In the first eight weeks of 1936 the railroads ordered 45 steam locomotives compared to one in the same period a year ago; 5,550 freight cars compared to 810; and 281,342 tons of rail compared to 128,000 tons during the first eight weeks of 1935.

The increased traffic so far this year and during the last four months of 1935 has increased the necessity for greater railway purchases—and at the same time has provided the means to make purchases. In turn, increased purchases of modern materials and equipment enable the railroads to handle passenger and freight business more satisfactorily and more economically, thus increasing net railway operating income. A greater utilization of modern methods, equipment and facilities will also enable the railroads to stop losses of traffic to other carriers and to recover business now handled by competitive forms of transportation.

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Facing Facts About the Railroad Problem

We have had the great depression, and it has been so profound and protracted, because it is hard or impossible to get most persons to face facts that are contrary to their prejudices or supposed self-interest and act in accordance with them. The discussions emanating from opponents of the New Deal illustrate this as well as those emanating from the New Dealers. Because both make principles of their prejudices the entire future of the nation is jeopardized. This paper agrees that New Deal policies have protracted the depression. But it came, lasted three years and reached bottom before the New Deal. Plainly, therefore, the New Deal did not cause it. What did? This question is obviously of as vital importance as any question regarding the New Deal; and as long as it is evaded by most political and business critics of the New Deal there will be abundant reason for skepticism as to whether defeat of the New Deal will be sufficient to restore prosperity and save the nation from state socialism.

No industry has suffered worse during the depression than the railroads. One of the most vital questions with which the nation is confronted is as to whether they can be saved from government ownership. What is the matter with the railways? What are the reasons for what is the matter with them? "Efficiency in Leash" was the title of an editorial that appeared in the Chicago Tribune of February 23. It strikingly illustrated the determination of most Old Dealers not to state or face disagreeable facts regarding the Old Deal. It attributed the present plight of the railways to the government's policy in regulating their rates from the passage of the Interstate Commerce Act in 1887 to the time when, under the Transportation Act of 1920, "a fantastic nostrum called 'scientific rate making' was foisted upon the railways. * * * By this time railroad rate making had wandered so far from its original purpose of moving traffic that shippers had

turned their attention to the development of competition—trucks, buses, barges, pipe lines—and, most important of all, to the decentralization of production to eliminate transportation. That was the condition that faced the New Deal, which could think of nothing better than a grand scheme of co-ordination through regulation of the newcomers."

Present Trend Began With Adamson Act

The *Railway Age* does not question that the Interstate Commerce Commission's policy of trying to regulate rates on a "scientific" basis—that is, largely on a distance basis—has contributed much toward causing the present railway situation. But to attribute it entirely, or even principally, to regulation of rates is to refuse to state or face the most important facts regarding it, and to present a very superficial view. The creation of the present railway situation began before the war; but it is principally due to conditions created by the Adamson Act, which was passed by Congress in 1916 and went into effect in 1917, and by government operation during the war and subsequent government policies, both Old Deal and New Deal. And it has been one of the principal causes of the protraction of the depression.

The railways, by their very nature, are an industry with an investment that is huge in proportion to its annual gross earnings or "turnover." This necessarily large investment in proportion to annual turnover requires that operating expenses and taxes shall be smaller in proportion to gross earnings than is necessary in most industries—or, to state the matter in another way, that net earnings shall be relatively large in proportion to gross earnings. In 1916 the operating expenses and taxes of the railways consumed only 71 per cent of their gross earnings. The Adamson act requiring the same wage to be paid in train service for eight hours' work as previously had been paid for

ten hours increased operating expenses; but even in 1917, the year before government operation was adopted, expenses and taxes consumed only 76.7 per cent of gross earnings. In 1918 and 1919, under government operation, the percentages increased to 86.9 and 91.2. In 1920, the first year after the railways were returned to private operation, it was 99.7, and in 1921 was still 89.1.

Revolutionary Change in Margin of Profit

As these figures show, the Adamson Act and government operation caused a revolution in the relationship between gross earnings, on the one hand, and operating expenses and taxes, on the other hand. The pre-war relationship between them was never anywhere near restored. In the seven years 1923-1929, inclusive, operating expenses and taxes averaged 82 per cent, and net operating income only 18 per cent, of gross earnings. In other words, throughout the prosperous period of the twenties the railways were operating on a relatively much narrower margin of profit than before the war.

As soon as the depression began, the ratio of operating expenses and taxes to gross earnings commenced increasing, in spite of the most terrific retrenchments in expenses ever made. It was 83.5 in 1930; 87.5 in 1931; 89.6 in 1932; 84.7 in 1933; 85.9 in 1934 and 85.6 in 1935—an average for the six depression years of 86.1 per cent. A table appearing herewith giving statistics for 1916, 1926 and 1935 shows strikingly the changes in results of railway operation that have occurred. The percentage of 5.90 return upon investment in 1916 was the largest in any year before the war and the percentage of 4.99 in 1926 was the largest

	1916	1926	1935
Gross earnings	\$3,596,865,766	\$6,382,939,546	\$3,450,495,033
Operating expenses	2,399,667,877	4,780,926,724	2,713,632,770
Taxes	157,113,372	388,922,856	236,793,115
Per cent expenses and taxes of gross earnings	71.1	81.0	85.5
Net operating income	1,040,084,517	1,213,089,966	500,069,148
Per cent of gross earnings	28.9	19.0	14.5
Per cent return on investment	5.90	4.99	1.93

in any year since the war; but the statistics for these two relatively prosperous years present some striking contrasts. Gross earnings in 1926 were 77 per cent larger than in 1916, but operating expenses and taxes were 102 per cent larger, with the results that the percentage of gross earnings consumed by expenses and taxes increased from 71 per cent to 81 per cent, while the percentage of gross earnings left for net operating income declined from 29 per cent to 19 per cent. The contrasts between the figures for 1916 and 1935 are even more significant. Gross earnings in 1935 were about 4½ per cent, or \$146,000,000 less than in 1916, while operating expenses and taxes were 15 per cent, or \$493,000,000 greater. The result was that net operating income was 50 per cent, or \$540,000,000 less

than in 1916, being almost 29 per cent of gross earnings in 1916, and only 14.5 per cent in 1935.

Rates Increased 50 Per Cent; Wages, 125 Per Cent

The causes of the increase in the ratio of outgo to income which began in 1917 were, of course, advances in prices, wages and taxes unaccompanied by proportionate advances in rates. The principal cause was advances in wages. The average hourly wage in 1916 was 28.3 cents. This increased under government operation in 1919 to 56.5 cents, and after return to private operation in 1920 to 67.6 cents. There were reductions of wages in 1921 and 1922, but they remained on a much higher basis throughout the twenties than before. In the seven years 1923-1929 it averaged 63.7 cents, or 125 per cent higher than in 1916. In 1930 and 1931, the first two years of the depression, it averaged 68.4 cents. A reduction of 10 per cent was in effect for about two and one-half years, but since the entire deduction from basic wages was eliminated on April 1, 1935, the average hourly wage has been 69.2 cents—higher than was ever paid in any entire year in history.

Railway rates were maintained on a higher basis during the twenties than before the war to offset the effect of the increases in operating expenses and taxes; but the increase of about 50 per cent in average revenue per ton-mile was small compared with the advance of 125 per cent in the average hourly wage; and the higher rates were applied to commodities the average wholesale price of which was 45 per cent higher than before the war. It is true that during this period freight began to leave the railways for trucks, barges and pipe lines, but the statement that "shippers had turned their attention to the development of competition" is misleading. It disregards the highly pertinent and important fact that government began helping shippers in the "development of competition" by greatly increasing its use of the taxpayers' money to provide inland waterways and commercial highways. Shippers welcomed the increased means of competition. But why? Because they were not regulated as the railways were. Because, as the cost of their service was largely paid with taxes, and they paid much lower wages than those that the government had forced upon the railways, they could render it "cheaper."

Restoring Power to Managements

"The pyramided result, in so far as the railways are concerned," says the Chicago Tribune, "is regulation, plus management, plus scientific rate making theories, plus co-ordination; the whole structure resting on the sophistry of just and reasonable rates which no one has yet been able to define. The phrase means nothing, so the rates derived from its mandate can mean no more." What the whole structure actually rests on is greatly increased unit costs and taxes. "The public will be deprived of the full efficiency of this, the world's greatest transportation machine, until legislation is over-

hauled to permit a restoration of railway management to railway officials."

What is meant by "restoration of railway management to railway officials"? Merely restoration to them of power to make rates? That would not do much good now. Operating expenses and taxes must be considered by managements as well as regulating authorities in making rates, and government operation and subsequent government policies have largely or entirely determined present unit operating costs of the railways and their taxes. Furthermore, there is pending in Congress a bill to require the railways to establish a 6-hour working day at 8 hours' pay. This would increase the present average hourly wage to 92 cents, and make it 225 per cent higher, or three and one-fourth times as large, as it was in 1916 when the Adamson act was passed. Does anybody believe that railway managements could work any miracle of rate readjustment that would enable them to get enough traffic and earnings to stand an increase of 33 per cent in the present highest hourly wage ever paid?

However much harm government regulation of rates may have done or be doing, it has not been by any means the principal cause of the present railway situation. If full power of initiating and changing rates were restored to railway managements, they would still be confronted with wages and other unit costs of operation and with taxes much higher than before the war. They would still be confronted with competitors that are not regulated as they are, and that, unlike the railways, are provided principally or entirely by public taxation with the highways that they use.

Would Public Stand a Nation-Wide Strike?

Do those who say they favor a "restoration of railway management to railway officials" favor repealing the federal Railway Labor Act, and thus giving railway managements freedom in dealing with wages and working conditions? If the Railway Labor Act were repealed, would they favor the railways reducing their labor costs to a basis comparable with those of operators of trucks and barges, even if the railways had to fight and win a nation-wide strike in order to do so? And finally, in order to equalize competition, are they in favor not only of abolishing railway regulation, but also of requiring all competitors of the railways to pay adequately for their use of waterways, highways and all other government-owned property?

A great deal of buncombe regarding the railway problem emanates from persons and newspapers posing as friends of both the railways and the public, but that are too ignorant, hypocritical or cowardly to state and face the facts, and all the facts, relative to the actual causes and the only solution of the problem. Its solution, and its only possible solution, under private ownership is the establishment of a much more favorable relationship between gross earnings, on the one hand, and operating expenses and taxes, on the other; and those who favor continuance of present government-made

competitive conditions in transportation, as well as labor leaders and others who are striving constantly to increase operating expenses, are, consciously or otherwise, driving the railways toward government ownership.

Efficiency in railway management is as great as it ever was and as great as it is in any other industry. The trouble is, that railway management is constantly being deprived of the results of its efficiency by government policies that increase its unit costs and subsidize its competitors. The railways employed only 994,162 persons in 1935, as compared with 1,647,097 in 1916, a reduction of 652,935; and yet their operating expenses were \$314,000,000 larger than in 1916. Here is the evidence of increased efficiency, and also the proof that the results of it are nullified faster than they can be produced. These figures are *facts* showing why the railways are drifting toward government ownership. When will those who profess to be opposed to government ownership and other socialistic policies begin to state and face such facts and to advocate the policies that they show must be adopted in order to prevent government ownership?

The Union Leaders Demand— What Do They Offer in Return?

The railway labor executives have announced their intention of opposing Co-ordinator Eastman's project for the consolidation of terminals. They are carrying on negotiations with railroad managements in the endeavor to secure concessions for protection of supernumerary employees in the event of consolidation—and with the avowed intention of going to Congress for an extension of the Emergency Transportation Act of 1933 in the event that the railroads will not concede what they are seeking. These labor executives are upholding a pension law, now under attack in the courts, which was jammed through Congress by their political pressure. Furthermore, they are demanding of Congress a six-hour day law, a train-limit law and an excess crew law designed greatly to increase the cost of railroad transportation service to the public.

On what grounds are these demands made? What do the labor executives offer in return for the concessions they seek? They do not hold out the promise of more performance per employee, which would justify increased payments. On the contrary, the legislative projects they propose would reduce the output per employee and thus the wherewithal to pay wages.

Nor are the demands based upon justice. Railroad labor, it is a matter of common knowledge, is paid at rates which, compared with those of other transport workers, are fantastic; and their hours of labor are a great deal lower than those of employees in competing agencies of transport. Similarly, in

pension legislation passed by Congress railroad employees are set apart in a class by themselves to receive benefits far in excess of those of other industries. Neither in justice, therefore, nor for a *quid pro quo* are the labor executives making their demands. Instead they base them on nothing more ethical than a show of political strength—the hope of intimidation of management, the public and Congress.

It can be freely conceded that an employee who has given long years of faithful service deserves better of his company than to be thrown unceremoniously out of work if it is possible to avoid that contingency. By the same token, it is unjust for an employee by force of rules which have not changed as conditions in railroading have changed, to collect a day's pay for two or three hours' work—or, as frequently is the case under existing rules, for no work at all.

The labor executives are asking everything in a one-sided transaction based on little but the fear of their political power. A concession of rules wherein the railroads are being mulcted for work not done, in return for better protection for superannuated and displaced employees, would change the position of the unions from something painfully near to a racket to one of social responsibility and respectability. Such a change would benefit the employees, the railroads and the public. Moreover it would bring union policy into harmony with the character of the great rank and file of the membership, who for the most part are the kind of men who deserve fair treatment and would prefer a give-and-take transaction to tribute levied by force.

The Lesson to Business of the T.V.A. Decision

"Improvement" of navigation is one of the powers vested by implication in Congress by the Constitution, while the manufacture and sale of hydro-electric power is not. When, however, navigation is improved and electric power results as a by-product, then the government may sell the power. Such appears to be a fair conclusion from the Supreme Court's majority decision in the Wilson dam case. That decision, it is true, dealt only with the dam at Muscle Shoals which, in addition to "improving" navigation, was also conceived originally as a national defense project—another power clearly lying with Congress.

Whether the Court would arrive at a similar conclusion in the case of another dam which promises little in the way of "improved" navigation or national defense remains to be seen. It also remains to be seen whether the utilities will call these other dams into question. We hope they will, and we wish them luck if they do.

The fact of the matter, of course, is that the T. V. A.

as a whole (and not the isolated segment of it which the Supreme Court has approved) is a fake through and through as a navigation project. Navigation is the by-product and the power project is the main purpose. That fact is as clear as a pikestaff. Transportation by rail is already available throughout the area at a much lower total cost than will be available by water after T. V. A. has changed the geography of the region. So there is no economic or social justification for improving navigation in the area.

If further proof were needed that power, and not navigation, is the primary purpose of the project, it need only be recalled that the government *sells* the power it produces, whereas *it has to offer the navigation facilities free in order to get anyone to use them*. Who ever heard of a producer giving away his principal product and selling only his by-products?

But the lesson the railroads and the public utilities and business generally should learn from this decision goes very much deeper than these legal and economic facts.

It is, instead, that they have got to quit depending upon the Supreme Court to protect them from the socialists and the boondogglers. Business has long been, and still is, complacent and even approving of socialist principles in transportation. (Do not the automotive manufacturers, the oil companies, and the roadbuilders approve government billions competing with private investment in the transportation industry? Are Mid-Western shipping interests and other businesses a unit in opposing the canalization of rivers in the Mississippi basin and of the St. Lawrence seaway project?) Certain business interests, sensing a profit, undoubtedly are quite content to see the spread of socialism in the power business. Their turn as the victims of socialization will come later; and where then will they look for defenders?

The socialists hunt in a pack. Business is made up of "lone wolves"—every industry for itself and if one can devour the other, that is quite according to Hoyle. If the socialists will hamstring one of the number so the others can more safely consume him, then three cheers for socialism! The socialists have done just that to the railroads with the active support of the most powerful private business interests in the country. They are now moving in on the power business. What isolated business will be next?

Divide and conquer—is a slogan which many a general heretofore has followed successfully to vanquish a more numerous enemy. It is being used with great skill by the socializers in this country, and their progress is openly aided, abetted and even led, insofar as it applies to transportation, by outspoken Old Dealers. The Supreme Court has refused to save business from its folly in failing to co-operate in a consistent policy of opposition to socialism. Now if it is to be saved, it will have to save itself. There is precious little evidence so far that it has either the intelligence or the magnanimity necessary for the task.

Looking Over a Part of the Truck
Tailboard Area on the Street-Level
Floor—Railroad Space in the Fore-
ground



Pennsylvania Provides Modern Mail-Handling Facilities at New York

Belt conveyors, latest type sorting tables and automatic elevators speed distribution of 150,000 sacks inbound and outbound daily

In conjunction with the opening on December 5, 1935, of a new annex to the general post office in New York, which lies directly over the wide expanse of tracks at the Pennsylvania station, the Pennsylvania put in service a comprehensive system of mechanical mail-handling equipment which greatly facilitates and speeds up its part in the handling of the large volume of mail entering and leaving the city daily via its lines. In an area already congested by tracks, high tension trolley wires, low tension third rails, platforms and building columns, it has provided more than 8,000 lin. ft. of new conveyors and chutes, which are designed to handle in excess of 250,000 mail pouches and sacks daily, and to make possible the loading or unloading of cars in 30 min. or less time.

In addition, at a total cost of approximately \$1,500,000, the Pennsylvania made extensive changes in its track and auxiliary facilities beneath the new post office annex; it has constructed one entirely new outbound mail-handling platform, approximately 650 ft. long; at the track level, it has provided six modern mail sorting tables to speed the sorting and distribution of sacked and pouched mail; and it has added two new automatic electric freight elevators to the six elevators already in service, to handle "outside parcels," which cannot be sacked or pouched.

Annex Construction a Problem

The general post office at New York is located directly west of the passenger station, facing on Eighth avenue, and spans the 36 depressed station and auxiliary tracks in the deep cut between Thirty-First and Thirty-Third streets, a distance of approximately 455 ft. The new annex unit, a five-story extension to the main building on the west, also spans the full width of the station track area, and has a depth of approximately 415 ft. to frontage on Ninth avenue.

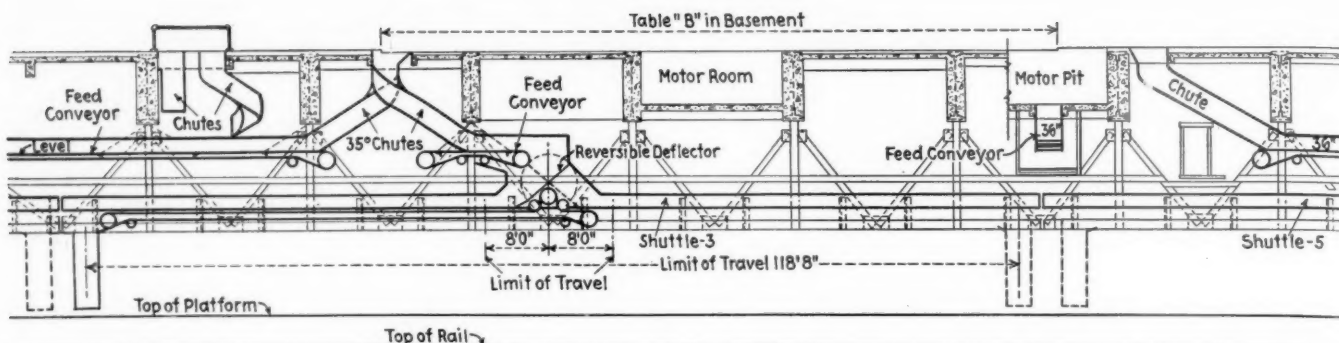
The construction of the substructure of this unit, completed during the summer of 1933, was one of the most

unusual and interesting substructure projects ever carried out over railway facilities. In this work, which was described in the *Railway Age* of September 2, 1933, a total of 206 column footings were put down through rock within the network of electrified station tracks, which at the time handled more than 1,000 passenger train and engine movements daily. Adding to the difficulties of construction, the area involved is honey combed with sub-surface drainage, express and conduit tunnels, and the rock encountered was found unsuited generally for footings without going to considerable depths.

The first level of the annex over the tracks, which is called the basement because it is approximately 15 ft. below the level of the surrounding streets, is said to be the heaviest building deck ever constructed in the country, involving girders up to 115 ft. in length and weighing 152 tons each. These long heavy girders were neces-



Traveling Deflectors at the Various Tables Distribute the Mail Over Slides Directly to Sorting Clerks on the Tables



Elevation of One of the Shuttle Conveyors Along the South Side of the Diagonal Platform Showing Certain of the Feed Conveyors From the Basement Floor Above

sary primarily because of the lack of room in the congested track area beneath to permit closer column spacing.

The second level of the annex, known as the first floor, is approximately at the street level and houses two broad internal driveways with a long expanse of undercover truck tailboard space for receiving or discharging mail. The upper floors are normal building floors which are used by various branches of the postal service for offices and for sorting, classifying, and pouching or sacking incoming or outgoing mail, to be dispatched later to points about the city and environs, or to be turned over to the railroad for movement to out-of-town points.

The Pennsylvania, as agent of the Post Office department, handles with its own forces the sorting of all sacked and pouches mail, and "outside parcels," which are turned over to it for movement by rail, or which are brought into the city over its lines. Normally, this business includes approximately 150,000 pieces daily, and involves the loading or unloading of approximately 250 cars every 24 hours, of which 110 cars are solid mail cars. During peak seasons, this volume of mail increases as much as 50 per cent, and the problem is complicated further by the fact that approximately 60 per cent of each day's outbound business must be handled between the hours of 8 p. m. and 2 a. m. Similarly, the greater part of the inbound mail arrives between 6 and 10 a. m.

Interested only in inbound and outbound mail by rail, and "transit" mail or mail transferred from inbound

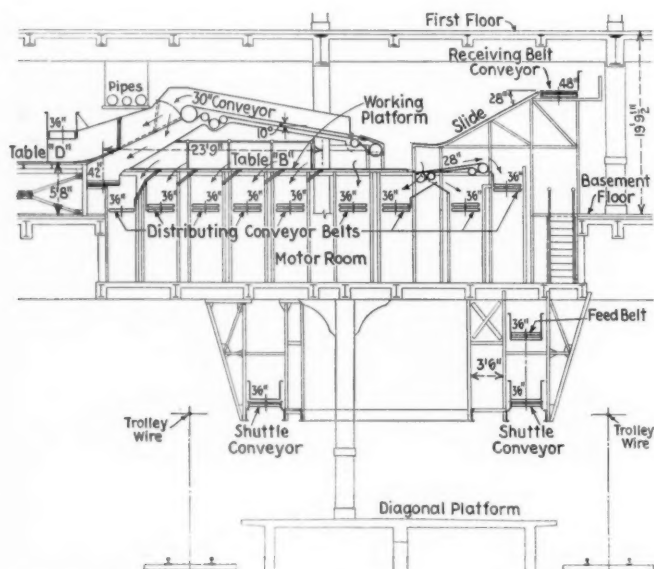
cars to outbound cars at New York for points beyond the city, the Pennsylvania's mail-handling operations are confined solely to a small portion of the street-level floor, the basement level of the annex, and the track level. At a section of the street-level, undercover tailboard space near Ninth avenue sufficient to spot eight trucks at a time, "made-up" outbound mail, that is outbound mail already pouches or sacked for specific destinations, is turned over to the railroad for its exclusive handling. This mail comes largely from postal substations and mail order houses in and about the city, where facilities are available for consolidating truck loads of outbound sacks and pouches, and also mail coming from New Jersey points via the Hudson River ferries. At other points along the long tailboard space provided on this floor, trucks with mixed loads of sorted and unsorted mail are handled by government postal employees, who, after breaking up and sorting the loads, turn over to the railroad such mail as is to move out on trains.

That part of the basement level of the annex which is involved in the railroad's handling of the mail is used almost exclusively for the sorting of outbound and inbound mail, and for the conveying of this mail either to cars or from cars to areas within the post office. Here are located five railroad-operated sorting tables and a large part of the belt conveyor systems which link these tables with the track level and the postal areas above. Here also, much of the trucking of "outside parcels" is done, the loaded trucks of classified parcels being moved directly to the track platforms by means of elevators.

The railroad-operated sorting tables on this floor are designated by the letters B, D, A, C and E, and are located as shown on the accompanying diagrammatic plan of the belt conveyor systems. Table B, the largest of the tables, is essentially an outbound table handling sacked mail, which includes only second, third and fourth class mail-matter. Table D is an auxiliary to Table B, and handles outbound sacked mail which passes over Table B, but which must be held up temporarily awaiting cars. Table C, which is also designated as the outbound preferential mail table, handles all pouches mail (first class), newspapers, and other classes of mail rating preferred or special handling. Table E handles outbound mail of all classes to points on the Long Island Railroad.

Inbound Mail Handled Separately

Table A is the main sorting point for inbound mail. This table receives all sacked and pouches mail for break up later within the post office, and all "transit" mail, which must be dispatched in cars of other railway lines entering the station. Another important inbound sorting table in the new mail-handling facilities, operated by the government but linked closely with the rail-



Section Through Table B and the Track Level Immediately Beneath, Showing the Relation of a Number of the Different Conveyors

ways facilities, is located on the first floor of the annex, and is known as the "Ferries" table. This table handles the sorting of all inbound sacked and pouched mail destined for further handling by the various Hudson River ferry services to points in New Jersey, and also handles "made-up" inbound sacks and pouches consigned to the various postal substations in and about New York.

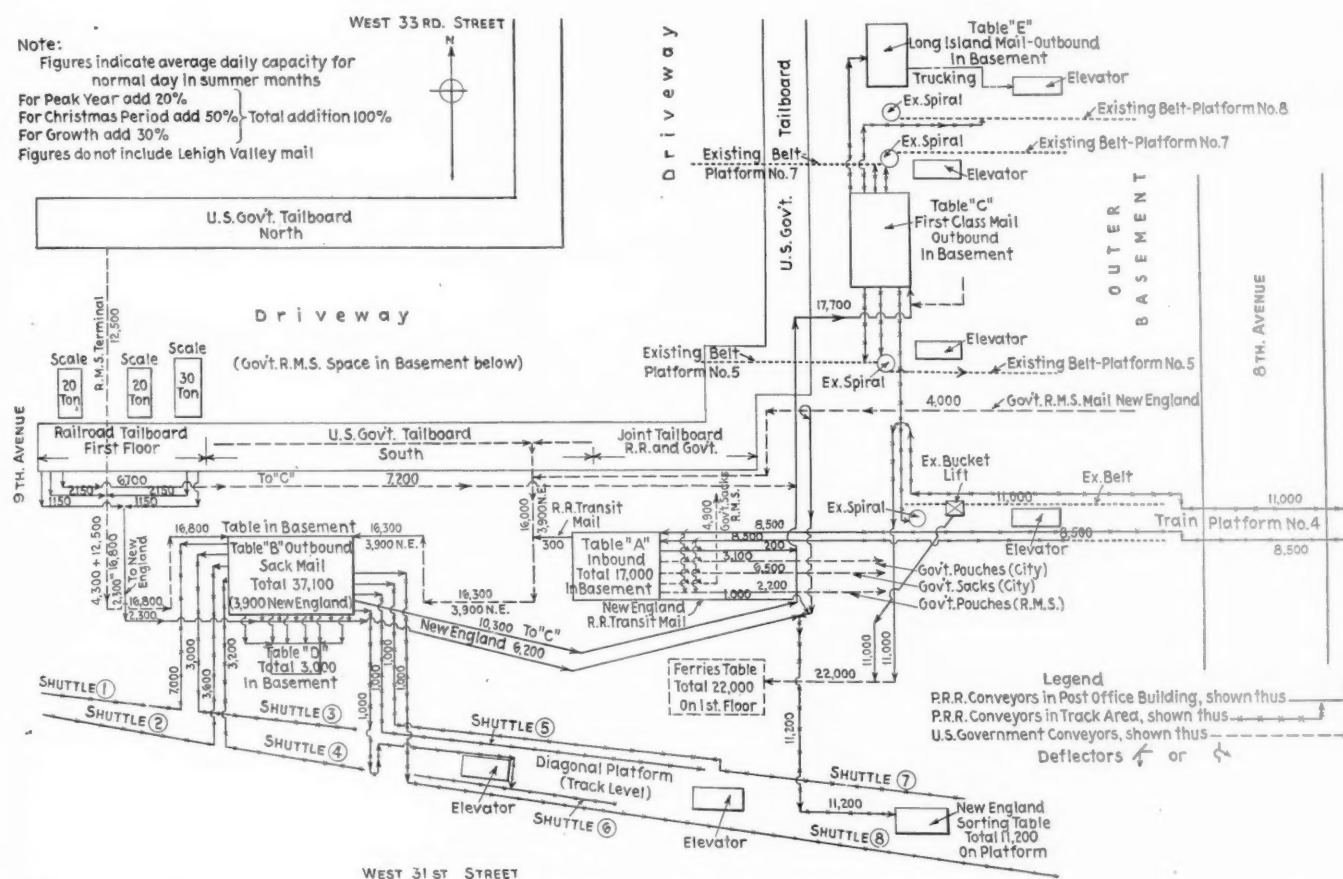
Still another sorting table provided in the new facilities and operated by the railroad, is called the New England sorting table. This table, which handles all outbound sacked and pouched mail destined to points in New England, is located at the east end of the new outbound platform provided by the railroad.

Most of the station track platforms are used to some extent for handling mail. Extensive mail handling is confined, however, to the new platform provided, which

This platform, which is 650 ft. long and 46 ft. wide at the east end, provides space along its side for loading 19 mail storage cars at a time. From this platform, solid cars are made up for various important points in the South and West, and also in New England. New England cars are normally handled at the east end of the platform, directly alongside the New England sorting table, while cars for the South and West are handled elsewhere along the platform, where most convenient for switching into trains.

126 Sections of Belt Conveyors

Important as are the individual features of the Pennsylvania's new mail-handling facilities, the key to their effectiveness as a whole lies in the arrangement of the belt conveyors provided to keep the mail flowing con-



Diagrammatic Plan of the Many Conveyors Used in the Railroad's Handling of the Mail, Showing Also Relative Location of Various Sorting Tables

lies along the south side of the station track layout, and to Platforms 4, 5, 7, 8 and 9, located further toward the center of the station. The new platform, which is called the "Diagonal" platform because of its angular alinement with respect to the more centrally located platforms, is strictly a mail platform, and is used for handling outbound storage-car mail alone, primarily of other than first or preferential class. The other platforms mentioned are not mail platforms exclusively, being used at the same time to handle passengers. However, of these, Platform 4 handles only inbound mail of the various classes, while Platforms 5, 7, 8 and 9 handle outbound preferential mail and Long Island mail almost exclusively.

The Diagonal platform is of particular interest, both because of the intensity of its use, and because of the latest types of mail-handling facilities with which it has been provided to speed the loading and dispatch of cars.

stantly into or away from cars. Wherever conveyors could be used to advantage to speed up handling and minimize physical effort, they were installed. Including a total of 126 individual sections connected in series to form trunk or feeder systems, the conveyors extend to and from the different sorting tables, between the tables and the track platforms or the post office areas, and, in one case, direct from truck tailboard at the street level to the points for loading cars.

These various systems of fixed conveyors are supplemented by a series of shuttle conveyors on the outbound platforms, with retractable chutes which can discharge the mail directly within cars, and by portable power belt conveyors on certain of the other platforms, which accomplish the same purpose or which speed the distribution of incoming mail to the break-up or reconsigning areas on the basement and first-floor levels. All of this equipment, which is used exclusively for the

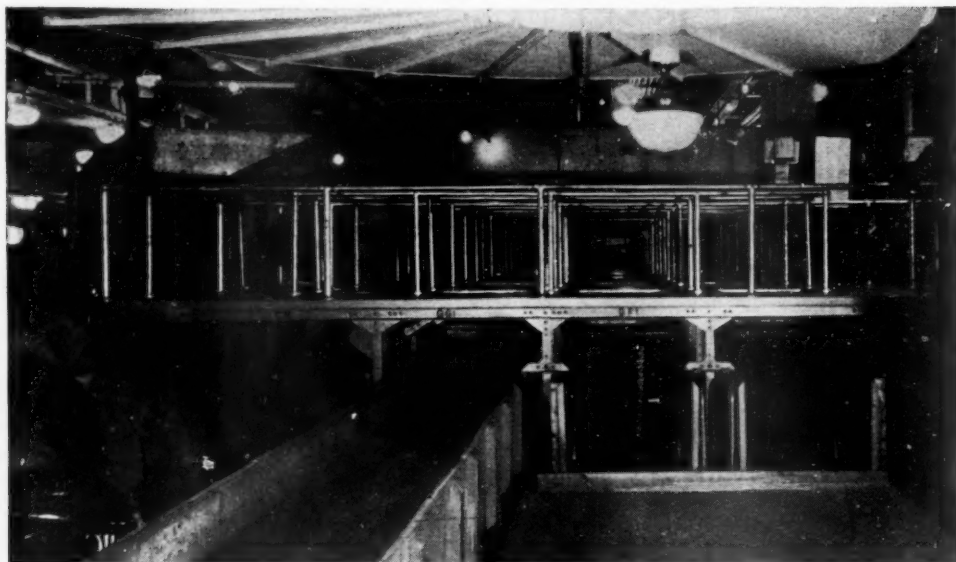


Table B, Served by Belt Conveyors Both Above and Beneath, is the Main Sorting Point for Outbound Sacked Mail

handling of sacked or pouched mail, is supplemented by large fleets of hand trucks and the elevators between the different floors and the platforms, used for the handling of parcels not readily sacked or pouched because of their weight, size or shape, or because of their fragile character or contents.

Outbound Mail Handled Rapidly

Part of the outbound mail handled by the railroad is turned over to it at the long tailboard platform on the first-floor level. At that part of the platform operated exclusively by railway employees, only "made-up" outbound second, third and fourth class mail is handled. All "outside parcels" are trucked away from the tailboard space for such sorting as may be necessary, and are then moved via trucks and elevators to outbound cars. All sack mail, on the other hand, is dropped piece by piece through any one of a series of 33 hatchways in the tailboard platform on to one of three railroad belt conveyor systems, depending on its destination.

These tailboard conveyor systems operate parallel with the face of the platform. One leads from both directions toward the center to a government trunk line conveyor directly beneath at right angles, which carries the sacks to the main outbound sorting table (B) on the basement floor. Another two-way system handles New England mail exclusively, dropping it on to a railroad-

operated trunk belt conveyor which by-passes Table B and extends some 430 ft. through the basement level to a chute leading directly down to the New England sorting table on the Diagonal platform.

The third conveyor system at the railroad's tailboard space makes direct connection to the east with a government-operated trunk conveyor handling outbound preferential mail. This latter conveyor extends approximately 275 ft. eastward through the basement level to a connection with another railroad conveyor leading directly to Table C, the sorting point for outbound preferential mail.

At Table B, which also receives outbound sacked mail over a conveyor from the government tailboard space on the first floor, the two feeding conveyors, with the aid of two traveling deflectors, distribute the sacks over the broad surface of a steel faced incline or slide, which carries them down directly before sorting clerks on the table proper. The table itself, which is approximately 88 ft. long by 32 ft. wide, is essentially a platform about five feet above the floor, the top face of which is perforated with parallel rows of rectangular sack drops or hatches. These various lines of drops, all of which are protected by pipe railings, lead to a series of belt conveyors beneath, eight of which extend to and feed the shuttle conveyors spread longitudinally along both sides of the Diagonal platform beneath. A ninth conveyor passing beneath this table extends to Table C, the outbound preferential table, approximately 400 ft. distant on the same floor. In addition, a series of six short belt conveyors extend laterally over the table to auxiliary outbound Table D, and a series of six short chutes feed directly on to the New England trunk belt conveyor, leading to the New England sorting table. Thus, all outbound "made-up" sacked mail is handled directly from trucks to trains without passing through the post office proper, in a minimum of time, and with a minimum of handling.

Many Conveyors Handle Inbound Mail

Inbound mail at the station, as already stated, is received on Platform 4. This platform is served by two old relatively short sub-surface belt conveyors and—by two new sub-surface belt conveyors, the latter extending beneath each side for a distance of more than 840 ft. Of the new conveyors, which largely replace the shorter conveyors, the one along the north side of the platform extends via straight runs, inclines, offsets and abrupt changes in direction, to the Ferries table on the first



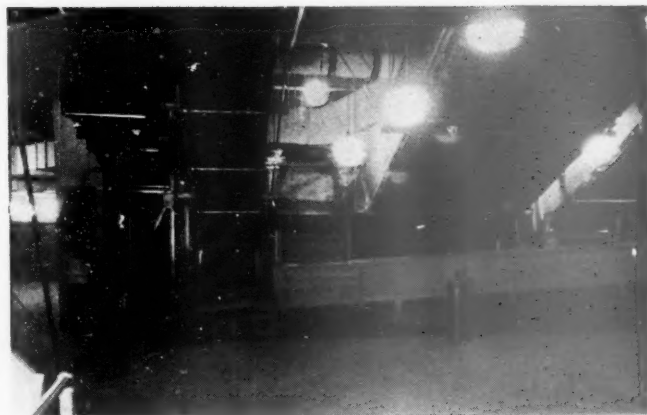
Shuttle Conveyors, With Flexible Revolving Chutes at Each End, Make It Possible to Unload at Any Point Along the Diagonal Platform, and Directly Into Cars, if Desired

floor, approximately 50 ft. above its lowest point. The conveyor along the south side of the platform, on the other hand, rises at its west end, with little change in direction, to a direct connection with Table A, the main sorting point for incoming mail. Both of these trunk conveyors are fed through hatchways at intervals along the platform, either direct from cars, or over portable platform conveyors which can be used as approaches to the hatchways from any direction.

From inbound sorting Table A, which is similar in design to Table B, there are seven distributing conveyors or conveyor systems. One of these, relatively short in length, leads to the trunk conveyor extending from Table B to Table C, handling outbound preferential and Long Island mail. Another handles railroad "transit" mail to Table B. Still another makes direct connection with and discharges on to the New England trunk conveyor. The remaining four conveyors, all of which are operated by the postal department, lead to various points directly within the post office.

Each of these different conveyors distributing from Table A is served by a series of hatchways in the table floor, and is usually fed through these openings. However, immediately ahead of the table, provision is made to shunt to any of the various distributing conveyors incoming solid car lots or sizable shipments of mail which are destined to the same point, thus avoiding the manual handling which would otherwise be necessary on the table. This is accomplished by means of two short shunt conveyors, extending from the two incoming conveyors laterally above the group of distributing conveyors, on any one of which they can be made to discharge by the proper adjustment of deflectors.

Table C, which is located directly above Platform 6, receives mail for sorting over a slide similar to that at Tables B and A, and is provided with hatches in its floor for distributing to lateral conveyors, which, in turn, feed longitudinal overhead conveyors on Platforms 5, 7 and 8. In addition to handling outbound preferential mail, this table also handles considerable mail of other classes destined to points on the Pennsylvania and the Long Island. Outbound Long Island mail is sent from Table C via chutes direct to platforms when cars are being loaded, but at other times it is sent to Table E, the Long Island sorting table. All mail received at Table E, after sorting, is trucked to chutes, or is moved directly to the track platforms via elevators. To facilitate the loading of the trucks, this table is of saw-tooth design,



A Few of the Belt Conveyors Leading From Table A, the Principal Sorting Point for Inbound Mail

which permits the side loading of 13 trucks at a time with minimum movement on the part of the sorting clerks.

Details of Conveyors

The conveyor systems installed by the railroad are of the latest type, with either ball or roller bearing-equipped rollers; with individual electric motor drive for each section; and with weighted pulley belt take-ups which automatically compensate for belt stretch. The electric motors employed are of the gear-reduction type, which, within themselves, produce the belt speed desired, without the usual auxiliary gear systems.

The conveyor belts range in width from 24 in. to a maximum of 60 in., but 42-in. belts are employed generally in the trunk conveyor systems and where there is no opportunity to use care in placing the sacks or pouches on the belts. The narrower belts are used generally on the shorter feed conveyors, particularly if exposed and where the individual sacks can be laid on them endwise without loss of time or undue inconvenience to the sorting clerks.

Three types of belting are used in the conveyor systems. On all horizontal or practically horizontal runs within enclosed areas of the building, plain stitched canvas belting is employed. On the shuttle conveyors at the track level, a rubber and fabric belting is used, and on all conveyor inclines, which are limited to grades of approximately 22 per cent, a special rough-top rubber



Table E, Handling Long Island Mail, is of Saw-Tooth Design to Facilitate the Loading of Hand Trucks

and fabric belting is employed. The conveying surface of this latter type of belting has a much higher coefficient of friction than either of the other types of belting, and thus permits steeper conveyor inclines than would be possible otherwise.

An interesting feature of the belt conveyor systems is the progressive speed arrangement incorporated in each system, wherein the speed of belt travel in each succeeding conveyor section is approximately 10 ft. per min. faster than that in the immediately preceding section. This feature was incorporated to prevent congestion at the points of discharge from one belt to another. Thus, in a conveyor system of five sections with a belt speed of 161 ft. per min. on the final section, which is the maximum speed reached by any of the belts in the station installation, the speed of the originating belt is approximately 121 ft. per min.

Shuttle Conveyors Speed Loading Cars

The new shuttle conveyors serving the Diagonal platform are an adaptation of the belt conveyor principle to meet the need for being able to discharge mail at any point along the platform. These conveyors, of which there are four along each side of the platform, are essentially movable horizontal belt conveyor units, which can be shuttled forward or backward on an overhead track through distances somewhat less than twice the length of the units themselves. With the point of feed to each shuttle unit approximately midway between its limits of travel, mail delivered at the point of feed will always fall on the shuttle belt, regardless of its position. By adjusting the position of the shuttle unit and by operating its belt in one direction or the other, the belt can be made to discharge from one end or the other, at any point within the limits of shuttle movement.

In the arrangement on the Diagonal platform, the individual shuttle operating limits range from a minimum of 117 ft. to 186 ft., and the lengths of the shuttle conveyors themselves range from approximately 64 ft. to 95 ft. Each shuttle conveyor is entirely independent of the others, and has its own individual feed belt system extending from beneath the drop hatches in Table B. Further more, each end of each shuttle unit is equipped with a flexible-joint aluminum chute, through which mail is transferred to the platform level. These chutes, with the proper spotting of the conveyor itself, can be extended directly within cars, regardless of their position along the platform, or they can be made to discharge directly on the platform in front of or alongside the doors of cars spotted at random. Equipped with chain hoists, the chutes can be swung to an upward position when not in use, clearing the platform area beneath for other operations.

Centralized Control of Conveyors

The control of all of the sections in each of the various conveyor systems is centralized at one or more specific points, so that by pressing a single button the belts over continuous routes are all set in motion simultaneously. For example, the belts leading from Table B to the Diagonal platform are normally controlled by push buttons in panel boxes adjacent to the points of discharge on the platform. If mail arrives at the table for a specific car outbound from the Diagonal platform, and the conveyor system leading to the position of that car is not in operation, the foreman at Table B signals the Diagonal platform his desire to have the conveyor system in question started. This signal is received on the platform in the form of a white light and a bell, directly at the shuttle conveyor involved. If the platform clerks are ready to receive the mail, they adjust the position of

the conveyor to discharge at the point desired, and then push the starting button. Simultaneously with the starting of the conveyors, white marker lights bearing the designation letters or numbers of the conveyor system involved light and remain lighted until operation of the system is stopped. Stop buttons are placed at each end of a conveyor system and at intermediate points where trouble may occur.

All of the mail handling facilities provided by the Pennsylvania were planned and installed under the direction of A. C. Watson, chief engineer, New York zone, assisted by T. W. Pinard, engineer of bridges and buildings, who was in charge of design, and E. L. Goldsmith, supervisor of construction, who was in charge of construction. The general contractor on the work, for both the railroad and the government, was James Stewart & Company, New York. The Lamson Company, Syracuse, N. Y., furnished the conveyors, which were installed by the general contractor. The government work on the entire project was in charge of E. F. O'Brien, construction superintendent for the Treasury department.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended February 15 totaled 631,347 cars, an increase of 9,250 cars over the total for the week before and an increase of 49,678 cars, or 8.5 per cent, as compared with the corresponding week of last year. Coal loading was especially heavy, amounting to 192,491 cars, an increase of 52,140 cars over last year's figure, but all other commodity classifications except merchandise and live stock showed increases as compared with last year. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

Revenue Freight Car Loading For Week Ended Saturday, February 15			
Districts	1936	1935	1934
Eastern	149,136	138,136	144,700
Allegheny	124,877	117,616	119,700
Pocahontas	53,628	46,090	44,516
Southern	93,057	87,358	92,617
Northwestern	64,918	67,694	67,161
Central Western	92,820	80,093	83,251
Southwestern	52,911	44,682	48,323
Total Western Districts.....	210,649	192,469	198,735
Total All Roads	631,347	581,669	600,268
Commodities			
Grain and Grain Products.....	28,109	25,192	30,272
Live Stock	9,975	11,571	16,470
Coal	192,491	140,351	149,429
Coke	11,329	7,801	11,120
Forest Products	26,469	24,734	23,037
Ore	5,615	3,911	4,177
Merchandise L.C.L.	144,290	155,750	160,760
Miscellaneous	213,069	212,359	205,003
February 15	631,347	581,669	600,268
February 8	622,097	591,327	573,898
February 1	621,839	595,951	565,401
January 25	584,691	555,528	563,100
January 18	611,408	562,826	561,902
Cumulative Total, 7 Weeks.....	4,228,394	3,939,103	3,922,648

The freight car surplus on January 31 totaled 231,406 cars, a decrease of 19,673 cars compared with January 14. The total included 137,546 box cars, 47,475 coal cars, 27,102 stock cars and 9,303 refrigerator cars.

Car Loading in Canada

Car loadings in Canada for the week ended February 15 increased to 43,256 from the total of 41,564 for the previous week but were 2,043 less than the total for the

same week last year, according to the compilation of the Dominion Bureau of Statistics.

		Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:			
February 15, 1936	.....	43,256	22,727
February 8, 1936	.....	41,564	22,335
February 1, 1936	.....	39,501	22,249
February 16, 1935	.....	45,299	23,563
Cumulative Totals for Canada:			
February 15, 1936	.....	278,088	152,681
February 16, 1935	.....	294,105	153,102
February 17, 1934	.....	277,787	147,030

Railroad Research

A BRIGHT picture as to the future of rail transportation in the United States largely resulting from an acceleration of research work started many years ago was painted by L. W. Wallace, director of equipment research, Association of American Railroads, in a speech before the Pittsburgh Railway Club at Pittsburgh, Pa., on February 27.

"Statements have been made," said Mr. Wallace, "that the railroad industry is on the way out, that it has served its day, that its equipment, practice and performance are obsolete, that it is blind to developments of science and engineering, and that it is unconscious of and unconcerned with the circumstances and requirements of this period. Nothing could be farther from the truth. Instead, the railroad industry stands on the threshold of one of the most active and fruitful eras of its history.

"Never in the history of the rail carriers has there been such an eagerness and alertness on the part of railroad executives, scientists, engineers and other employees to apply any new procedure that will enable the railroads to make available more economical, efficient and safe transportation as exists today. These facts have found expression in the expenditure during the worst economic depression of our national history of something like \$40,000,000 for the air-conditioning of passenger equipment since 1932. It also has been demonstrated by the large expenditures that have been made for new streamlined passenger trains, improved types of locomotives and freight train cars as well as scores of other improvements that have been made by the roads despite the low tide of traffic."

Mr. Wallace said that although the railroads have done a great amount of research work themselves, the railroad industry is in a different position from that of other industries because of the fact that the rail carriers produce only transportation and very few of the things that are used for bringing that about.

"The railroad industry," he added, "has very wisely left the manufacture of those things which it uses to those whose primary function is the production of commodities. Therefore, for the more than 70,000 individual commodities, including such things as pins, needles, rails and bridges, used by the industry, it, as a buyer, goes into the market and makes purchases the same as an individual who purchases a sack of flour, an automobile or a suit of clothes. Because of this long-standing sound policy of the railroad industry to buy and not to manufacture the commodities it uses, it is one of the best and most sought after customers.

"As a result, out of the hundreds of millions of dollars spent annually for research by such industries as the steel, chemical, electrical, textile, railway supply, and others, a measurable amount is spent directly in response to the needs of the railroad industry and therefore it

benefits very directly because of such expenditures. In a real sense, therefore, the railroad industry has working for it, indirectly in some cases it is admitted, a very large research personnel and equipment, the annual cost of which is certainly more than a billion dollars. In the last analysis the railroad industry pays a measurable amount of the cost of such research as is devoted to developing the commodities it uses in the price it pays for such commodities."

Mr. Wallace pointed out that in many cases railway supply companies are headed by men who have spent many years in railroad work and because of that experience have gained a valuable knowledge as to the needs of the railroads.

"Notwithstanding all the discussion concerning the research conducted by the railroads," Mr. Wallace continued, "their place as purchasers is in the applied research group, and for this they need make no apologies, for through long years many of the railroads have maintained well organized and equipped test departments. In addition, through numerous organizations within and associated with the industry a great amount of research has been and is being done.

"The sum spent by both the railroad and railway supply industries annually for research is very large and is undoubtedly as large as that of many other industries. And this would be disregarding the expenditures of that long list of other industries which sell commodities to the railroads.

"The locomotive today," he continued, "is as different in its refinements, appliances, design and performance as the man of today is different from the prehistoric man. The locomotive of 1829 was a marvel because it could travel at the rate of 10 or 15 miles per hour. Some of the modern ones today, however, can and do travel at 110 to 115 miles per hour. There is as much difference between the locomotive now in use and that of only 20 years ago as there is between the automobile of 1910 and that of 1936."

Mr. Wallace said that the locomotive of 1930 had an increase of nearly 30 per cent in pulling power compared with the locomotive of 1910, while the tonnage rating of the 1930 locomotive was more than 40 per cent greater than 20 years ago. The locomotive of 1910 had to stop every 40 miles for water, while today it can travel 85 miles between drinks.

A few years ago, on the Illinois Central, locomotives were changed every 100 to 150 miles, according to Mr. Wallace, who said that formerly four locomotives were used to move a passenger train from Chicago to Memphis, a distance of 500 miles. "Now only one locomotive is used for the same run," he said. "This record is typical of that of many, if not all, railroads."

Despite the increased speed and tractive power of locomotives, Mr. Wallace said that the pounds of coal consumed in moving 1,000 gross tons one mile is 24 per cent less for the 1930 than for the 1910 locomotive, and 22 per cent less than for the 1920 locomotive.

"Records show," he added, "that the savings made in the 1929 fuel bill, due to the increase in efficiency of its use which had been effected since 1920, was \$91,300,000, and the saving made in the fuel bill for the same reason over a period of twelve years ending in 1932 amounted to almost \$630,000,000."

Mr. Wallace referred to the large number of speeded up freight schedules, in which overnight runs of as much as 500 miles are accomplished, and to the number of passenger train schedules which average more than 60 miles an hour, including all stops. He pointed out that these schedules are accomplished by steam-powered trains as well as Diesel- and electric-powered trains.



The Silver Link which Operates the Silver Jubilee Train of the London & North Eastern between London and Newcastle, 268 Mi. in 4 Hrs.†

Some Observations on Old World Transportation Problems*

As in this country, the economic advantages of steam power make it supreme factor in handling rail traffic

By George W. Alcock

Assistant to President, Lima Locomotive Works, New York

I T was my privilege this last summer to spend some time on the lines and in the shops of the railroads of Great Britain, France and Germany, riding their trains and locomotives. Everywhere I went I was received most courteously, and nothing was left undone to make it possible to secure information. Furthermore, I found a universal and sympathetic interest in what you are doing on American railroads. I had a definite job to do and did not have a roving commission to make a general investigation of railroad problems. One cannot spend two intensive months on railroads of the Old World, however, without making certain observations. My impressions can be stated under three distinct headings:

First—Transportation is going through a period of transition or evolution under which the railroads will either lose the position they have so long enjoyed as the principal means of transportation both for passengers and goods, or they will emerge from this period of transition or evolution more soundly entrenched than ever before in the minds of the public, provided they modernize their methods to meet the demands of a new generation. This involves co-ordinating their activities with highway carriers to offer the maximum service to

the public, and organizing to meet highway competition where intelligent co-ordination ceases to be in the public interest.

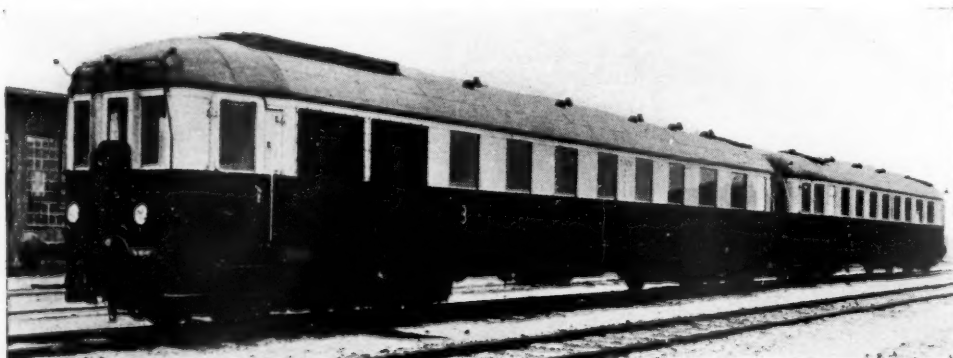
Second—Co-ordination and competition involve a study of more than merely motive-power designs. In the complexities of national life, the profitable operation of transportation agencies depends on a prosperous economic national structure. Motive-power policies must, therefore, be based on a sound conception of the economic factors which make for national prosperity.

Third—The indications abroad are that taking these factors into consideration railroad properties can be maintained as profitable enterprises.

If any one thing made an impression on me it was the fact that in all the countries visited railroading is no longer considered an isolated industry; it is an important part of a new industry—transportation—and wherever we went we found that the old theory that regulation of railroads must be inhibitory is fast being discarded as not being in the public interest. While the regulation of other forms of transportation has only recently been undertaken, the necessity of being fair to the railroads is rapidly becoming a part of national policies. We are

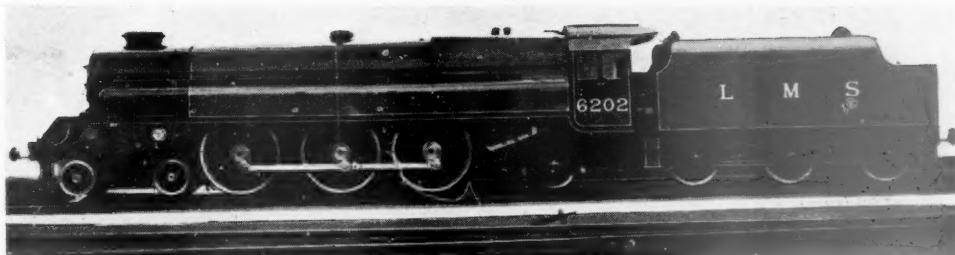
† In actual service one of these locomotives is reported to have covered the distance between mile posts 30 and 55, a distance of 25 miles, in 13 min. 57 sec. A distance of 70 miles is reported to have been run in 45 min. 44 sec.

* Abstract of a paper presented before the February 17 meeting of the Western Railway Club.



A Steam Motor Train of the Lubeck & Buchener Railway in Germany

Non-condensing Steam Turbine Locomotive of the London, Midland & Scottish



moving towards the same goal here, not perhaps as fast as some of you would like, but the ice has been broken, and railroad men can look for better days as far as fair competition is concerned.

In the short time which has elapsed since highway transportation was regulated in both Great Britain and France it is significant to observe the marked improvement which has been made in highway operation, and, while, under regulation covering all forms of transportation, the railroads are assured of much fairer competition, it is undoubtedly true that the competition they face is in some respects much more stern.

The attitude of the public towards rail transportation in the principal countries of Europe is not unlike that obtaining in the United States. Without perhaps realizing it, people the world over are speed-conscious. In railroad passenger traffic this means that there is a demand for more and faster trains, and with a choice of transportation media which was not available twenty years ago the traveler expects that the railroads will provide trains at convenient hours which will transport him to his destination at something approximating the speed at which he feels they are capable of operating.

In freight service speed-consciousness is evidenced by the manufacturer who wants quicker movement of basic materials and by the merchant who demands quick shipment of the goods he orders for his shelves. The demand for speed in freight service is partly due to the necessity which the economic depression has forced on industry, namely,—that of reducing the investment in inventory to a minimum.

Under the relentless process of evolution highway transportation grew so rapidly that, as might be expected, flagrant abuses developed. This emphasized the economic fallacy of permitting any form of transportation, which was essentially unregulated, to destroy rail transportation, which, after all, is of vital importance as the nucleus of any national transportation system. It is safe to say that in all of the principal countries of Europe the pendulum of public opinion is slowly but surely swinging back to a realization of the tremendous importance of a sound railroad system as probably the most essential branch of national defense in time of war and the greatest single factor in maintaining a reasonably orderly and economical national existence in time of

peace. The importance of co-ordinating highway and railway transportation has, therefore, received consideration in all of the important countries of the world, and with a more enlightened public opinion executives of the principal railways of Europe have been endeavoring to meet these changed conditions of transportation.

New problems require new tools, and we saw experimental locomotives of all kinds, reciprocating steam locomotives, steam turbine, electric, Diesel-electric, Diesel-mechanical drive, Diesel with hydraulic coupling and mechanical drive, Diesel with turbo-hydraulic drive, we saw flash boilers, water tube boilers, steam rail cars, and so on ad infinitum.

One conclusion seems inescapable—namely, that abroad the Diesel locomotive with various forms of drives has made a definite place for itself in switching and possibly branch-line work. That it is a factor in main-line transportation, either for passenger or freight service, is extremely questionable.

If the wealth of a nation is in direct proportion to the development and utilization of its natural resources, then it follows that in countries rich in coal deposits and where, therefore, a prosperous coal-mining industry is essential to a sound industrial structure, it is obvious that anything which would materially affect the profitable operation of the coal-mining industry would have a serious effect on industry generally. In railroad operation this would be reflected in a consequent reduction in carloadings. As carloadings decline the capital expenditures of the railroads decline, and abroad, as here, the capital expenditures of the railroads play a very important part in the profitable operation of the durable or capital goods industries so essential to industrial prosperity.

Germany, of course, was the birthplace of the Diesel motor, and this type of prime mover has probably had its greatest development there. Second to Germany in the development of the Diesel motor was Great Britain. There are sound reasons why Great Britain should be interested in the Diesel motor. Surrounded as it is by water it is dependent on its mercantile marine for much of its food and many of the other necessities of life. Its export trade is of necessity overseas. In time of war its naval and mercantile fleets are of first importance. Any type of power, therefore, which shortened the time

A 2-4-2 Poppet-Valve Tank Locomotive Built by the Austrian Federal Railways, an Example of Special Design To Meet Highway Competition—With 57½-In. Drivers, It Is Said To Have Attained a Speed of 74 M.P.H.



of bunkering and extended the cruising range was of vital importance, and the development of the Diesel motor in marine service, was undoubtedly undertaken from this standpoint.

In the natural course of events both Germany and Great Britain extended the use of the Diesel motor into the field of rail transportation. In both countries, however, a study of all the factors involved has demonstrated that the interests of the railroads themselves are not best served by any intensive development which ignores the coal-burning steam locomotive for main-line service.

In Great Britain as in the United States coal represents the largest single commodity moved by the railroads. It represents a very substantial part of the freight revenue. With the loss in traffic which British railroads have already suffered at the hands of highway operators and the intensive development of highway transportation under recent legislation any substantial loss in coal tonnage with its consequent reduction in freight revenue would have a very marked effect on railroad earnings. On the other hand, the purchase of coal for use as fuel by the railroads is of material interest to the coal-mining industry, which has seen its production fall from 250,000,000 tons in 1922 to 126,000,000 tons in 1926, the year of the disastrous general strike which had such a marked effect in precipitating the industrial depression in Great Britain. The increased initial cost of Diesel-electric locomotives, together with the fact that maintenance costs were not sufficiently low, clearly indicated to railroad executives that large scale installation of Diesel-electric locomotives with its consequent effect on the coal-mining industry and therefore on carloadings was not in the best interests of the railroads themselves.

The fact that Dr. Diesel conceived and developed the Diesel motor in Germany had a tremendous influence there in creating a popular demand for this type of power, and it was only natural that the German Railways would be influenced by this development. The result was that the Diesel motor had a very elaborate trial as a motive power unit for rail service in Germany, and unquestionably every effort was exerted to make this type of motive power a success. The factors which were so important in Great Britain, however, the high initial cost and the effect on the national economic structure in any large installation of Diesel locomotives through its depressing effect on the coal-mining industry and railroad carloadings—compelled the officials of the German State Railways to undertake a thorough investigation of the best type of motive power for use on their lines, all factors being taken into consideration. This intensive

study resulted in the construction of many types of experimental locomotives which were submitted to exhaustive service tests. The results of these tests are covered very fully by Dr. Nordman of the German State Railways in the following definite statement made by him:

In view of these facts, the value of standard locomotives have increased considerably, and efforts to develop further details of the established, reliable, fundamental type of locomotive, while retaining its basic structure, have come to the fore in tests as well as in practice. For, any improvement in thermal efficiency obtained in this way is essentially an improvement in total efficiency, because there is no significant increase in first cost or in maintenance costs.

One cannot visit Germany without realizing the national desire to be self sustaining. This undoubtedly has had some influence on the development of steam power as a means of utilizing coal. At the same time, however, this obsession to be self sustaining has resulted in the intensive development of new industries, an exceedingly important one being the conversion of their brown coal to oil through the hydrogenation process. This is now commercially developed, and I rode on a steam motor train on the Lubeck & Buchener Railroad, the power plant of which was a flash boiler, and a compound steam motor, the motor being located directly on the truck. The boiler developed a pressure of 1,000 lb. per sq. in., and burned oil made from brown coal, which sold at a price much lower than imported oil. This oil, therefore, is available for Diesel motors, but I was told by German Railroad officials that their tests showed so clearly the superiority of steam power for main line work that there was no option but for them to confine the use of the Diesel to switching and branch line, except in a few cases like the Flying Hamburger, where the desire for publicity alone influenced the selection of power.

Trends in Steam-Locomotive Development

Our economic situation here is not unlike that which obtained abroad three or four years ago, namely, that on account of the prolonged economic and financial depression the number of new motive power units installed per year has been negligible. On the other hand, the countries abroad have emerged from the depression on such a substantial basis that motive power construction has been undertaken on a larger scale.

The experiments in Europe with locomotives of unusually high pressure have indicated that the advantages are not sufficient to compensate for the increased initial cost and the increased cost of maintenance. New designs, therefore, incorporate conventional boilers, the pressures, in most cases, within the limits of staybolted boilers. In Germany, a pressure of 20 atmospheres (294 lb. per sq. in.) has been tentatively adopted as standard, although a few locomotives have been built with pressures of 25 atmospheres.

The multi-cylinder locomotive still continues to hold a definite place in the motive power picture abroad. The compound locomotive has its greatest development in France, and unusually good results are being obtained from the French compounds. In considering the place of the compound locomotive, the question of fuel supply must be taken into consideration. In speaking of compound locomotives I have in mind locomotives within the range of a conventional boiler, as the multi-pressure locomotive has been practically abandoned.

In France coal averages about 120 francs per ton delivered on the tender. At the average prevailing rate of exchange this means about \$8.00 per ton. A good figure for the efficiency of the four-cylinder balanced compound over a two-cylinder simple locomotive is about 9



A British Condensing Steam Switcher with Flash Boiler Operating at 1,000 Lb. Per Sq. In. Built by the Sentinel Works

per cent. This figure was given to me by Mr. Chapelon, Chief of the Locomotive Engineering Department of the Paris-Orleans-Midi Railways. Furthermore, the question of the availability of the fuel supply must be given some thought. In France, in normal times, 50 per cent of the coal is imported and during the World War this percentage varied from 50 per cent to 100 per cent. Anything which provides an economy of 9 per cent or 10 per cent in fuel is, therefore, exceedingly important.

It is quite noticeable that in Germany and England, both large coal-producing countries, the compound locomotive has not received the same intensive development that it has in France. In both of these countries the three-cylinder simple engine has received quite as much attention as the four-cylinder balanced compound. This necessity of conserving fuel as a national policy has resulted in the development of the four-cylinder balanced compound locomotive in France to a point of efficiency which has resulted in a locomotive which, for coal rate and horsepower output per pound of total weight, is probably not exceeded anywhere in the world.

A notable example of increased horsepower will be found in the results obtained from the Paris-Orleans 4-8-0 type locomotives reconstructed from their earlier Pacific type. In addition to modifying the wheel arrangement, changes were made in the boiler, including, among other things, higher pressure, improved superheater and Thermic syphons. Poppet valves were applied to both the high- and low-pressure cylinders. The earlier engines developed 1,580 maximum hp., whereas the reconstructed engines developed 2,960 maximum hp. These figures in each case were actual dynamometer-car results, with correction made for level track. The maximum indicated horsepower was increased from 2,000 in the original design to 3,800 in the converted engines.

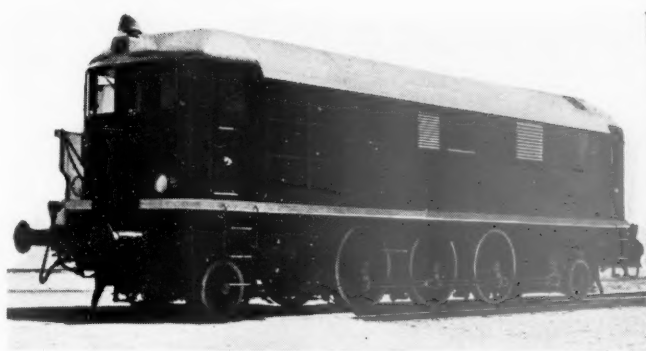
In order to retain the four-cylinder principle, and at the same time provide the capacity for handling heavy high-speed trains, very ample steam passages are provided from the dome right down through to the exhaust from the low-pressure cylinders, and in order to secure the greatest horsepower capacity a very intensive study has been made of the poppet valves. It was interesting to find that the poppet valves have been applied abroad to over 1,500 locomotives, including, two-cylinder, three-cylinder and four-cylinder, and that the development is on a sound basis. Many railroad men there who have had experience with the poppet valve expressed the opinion that it was the most important single development in the locomotive since the advent of the superheater.

The importance which is attached to the use of the steam locomotive is demonstrated by the fact that the railroads of France have recently co-operated in the building of an unusually fine test plant at Vitry. Eighteen locomotives have been tested to date and the tests are made available to the responsible officials of the various railroads so that in new designs advantage can be taken of test results.

The Speed Problem

In all of the countries of Europe the intensity of traffic on the rails has led railroad men to the opinion that in order to compete with highway and airway transportation what is needed is a greater number of trains operating at higher average speed than the public have been accustomed to without, perhaps, attaining the maximum speed of the Flying Hamburger, which was the prototype of the present day high-speed train.

An unusually high-speed train operating once or twice a day through congested areas disarranges the signal system and train operation to a point where any return



A 1,380-Hp., 2-6-6-2 Type Diesel Locomotive with Voith Turbo-Hydraulic Transmission, Built by Maffei-Kraus for the German State Railways

which the train can produce is out of proportion to the cost which is involved in the entire derangement of the operating system. Present-day studies abroad, therefore, are more to see what can be done generally to speed up the entire range of train operation rather than to provide a few trains whose speed is greatly out of proportion with that of the rest of the operation. This was quite clearly emphasized by a English railroad officer, who stated that what was needed was more and faster trains, and that he realized that this meant much more rapid acceleration, deceleration and high average speed. This thought is passed along to you for what it may be worth.

An outstanding feature of the experimental high-speed steam locomotive of the German State Railways is the driving wheels which are 2,300 millimeters (90 $\frac{1}{16}$ in.) in diameter, the locomotive being designed with the idea of providing not only a high average speed, but a high maximum speed.

I have endeavored to place before you some of the problems which have confronted railroad men overseas, and how they are meeting these problems, and I think you will agree with me that there is one inescapable conclusion; namely, that in the field of rail transportation steam is still supreme.

Discussion

A. N. Williams, president and general manager of the Chicago & Western Indiana, stated that in his opinion questions regarding the respective fields of usefulness of both steam and Diesel motive power are being rapidly clarified. He mentioned the great advantage of Diesel locomotives in high availability and said that steam locomotive builders must meet this challenge by improvements in design, which will permit using steam locomotives a greater percentage of the time. Mr. Williams stressed the necessity of securing increased efficiency of steam locomotives, since railroads are likely to be faced with increased fuel costs owing to the Guffey coal bill, and also because the demand for increased operating speeds have a marked tendency to increase unit fuel costs.

W. H. Winterrowd, vice-president, Franklin Railway Supply Company, Chicago, recalled Mr. Alcock's reference to 90-in. driving wheels and said that in his opinion the high-speed passenger locomotive of the future will have as large driving wheels as it is practical to install under the boiler in order to cut down piston speed, reduce cylinder maintenance and simplify valve and cylinder lubrication. In connection with the possibility for improvement in steam locomotive design, Mr. Winterrowd said that the steam consumption per indicated horsepower was cut from 28 lb. to about 20 lb. by the

installation of superheaters and that further refinements have reduced this figure to 16 lb.; also that one or two locomotives with poppet valves have been operated on test runs in this country, showing a steam consumption as low as 13 lb. per indicated horsepower-hour. This substantially reduced steam consumption per unit of power developed will simplify the problem of providing adequate boilers for modern power.

L. W. Wallace, director of equipment research, A. A. R., sounded an optimistic note by saying that he had never experienced a time in his contact with any industry when it seemed to display such a fundamental, aggressive and forward-looking attitude as characterizes the railway and railway supply industries at the present time. Without appearing as an advocate either of the steam locomotive or the Diesel locomotive, Mr. Wallace said he was confident that in the years, or possibly months, immediately ahead, some outstanding developments in steam locomotive design may be anticipated which will greatly increase the effectiveness of this type of power in railway service. He mentioned a specific condensing locomotive unit, designed for use in the United States, which may produce a steam performance of 8 lb. to 10 lb. per indicated horsepower-hour, or even less than the figure mentioned by Mr. Winterrowd. He expressed the hope that this locomotive will be built as an experimental unit and predicted that, if successful, it will arouse wide interest throughout the world and bring about a renewed appreciation of the possibilities of steam locomotive design and construction.

F. G. Gurley, assistant to the vice-president, Chicago, Burlington & Quincy, mentioned the effect of nationalization programs in limiting engineering developments in various countries and said that America, with vast natural resources of both coal and oil, should be able to find a more satisfactory solution to motive power problems than would be possible if the kind of fuel used, for example, were more or less dictated by national policy. He made a strong plea for the free exchange of information regarding the relative costs, efficiency, availability and operating advantages of both steam and Diesel power in order that each may be used in the service for which it is best adapted. He suggested the need of additional research to adapt coal-burning locomotives to the requirements of modern high-speed service, particularly as regards a higher degree of availability.

In response to an inquiry, Mr. Alcock explained that the application of roller bearings to railway equipment abroad has not been on nearly as extensive a scale as in this country. Plain bearings are used for main axles, truck journals, rods, etc., almost universally in Europe.

C. T. Ripley, chief mechanical engineer, Atchison, Topeka & Santa Fe, urged that railways make an unbiased investigation of the relative advantages of steam and Diesel locomotives with a view to developing the full possibilities of each type of power. He said that Diesel motive power, as applied to rail service, is still comparatively in its infancy; that no one expects it to replace steam power completely or generally; and that in due time it is bound to find its real place in the transportation picture. Mr. Ripley maintained that Diesel locomotive development in this country has surpassed that abroad through the development of light-weight, high-speed Diesel engines better adapted to transportation requirements. One important advantage of Diesel power pointed out by Mr. Ripley was the fact that in certain parts of this country, where railroads pass through dry plains and deserts, water is almost as expensive as fuel and Diesel power has an important advantage.

New Executives of General Railway Signal Company

ALFRED H. RENSHAW, senior vice-president of the General Railway Signal Company, has been elected chairman of the board; his son—Paul Renshaw, vice-president in charge of sales—has been elected president; and Sidney G. Johnson, assistant to the president, has been elected vice-president in charge of sales. These executive changes, which were announced in the *Railway Age* of February 15, followed the death on January 23 of Wilmer W. Salmon, who had been president and general manager of the G. R. S. since its formation in 1904. A photograph of Mr. Salmon, together with a sketch of his career, appeared in the *Railway Age* of February 1, page 215.

Alfred H. Renshaw was born on November 24, 1861, on Staten Island, N. Y. He attended Virginia Military Institute and in 1883 he was graduated from Rensselaer Polytechnic Institute, Troy, N. Y., with the degree of civil engineer. He later became a trustee of Rensselaer. From 1884 to 1887 he was assistant engineer of the New York Aqueduct Commission, following which he served for two years at the United States Navy Yard, Charleston, Mass. From 1889 to 1892 Mr. Renshaw was a member of the firm of Burden, Renshaw & Co., Troy, N. Y. He became treasurer of the Trojan Car Coupler Company in the latter year, and, being elected president in 1893, he served in the latter connection until 1906. Meanwhile Mr. Renshaw was also president of the Standard Signal Company from 1896 to 1903. He became president of the Federal Signal Company in 1908, a position which he retained until 1923 when that company was absorbed by the General Railway Signal Company. From the time of the merger until his present election to the chairmanship he was vice-president of the G. R. S.; the chairmanship has been vacant since the death in April, 1933, of John N. Beckley, who was also president of the Toronto, Hamilton & Buffalo. Mr. Renshaw also served as president of the General Railway Signal Products Company from 1924 to 1928. He is the inventor of the Trojan car coupler and many railway safety devices.

Paul Renshaw was graduated from Columbia College with the degree of civil engineer in 1911. In the same year he entered the service of the Federal Signal Company, Albany, N. Y., and then for about one year was in the engineering department of the General Vehicle Company, Long Island City, N. Y. In the spring of 1914 he returned to the service of the Federal Signal Company and served through all departments in its factory. From May, 1917, until 1919, he served in the United States Navy and then returned to the Federal Signal Company. In 1923 the Federal Signal Company was consolidated with the General Railway Signal Company and Mr. Renshaw became sales manager of G. R. S. and from April, 1928, until his recent election to the presidency, he was its vice-president in charge of sales.

Sidney G. Johnson was born in 1874 at Eccles, Lancashire, England, and came to this country at the age of 12 years. After attending a preparatory school he was employed for two years in the construction gang of the Johnson Railroad Signal Company, Rahway, N. J., where he had previously worked during school vacations. He was next associated for one year in a similar capacity with the Union Switch & Signal Company and in 1896, when the Standard Railway Signal Company

(Continued on page 364)



Eastbound Train Approaching Edgington

C. & O. Installs Remote Interlocking

Outlying mechanical plant replaced by power switches
and signals controlled from tower
four miles away

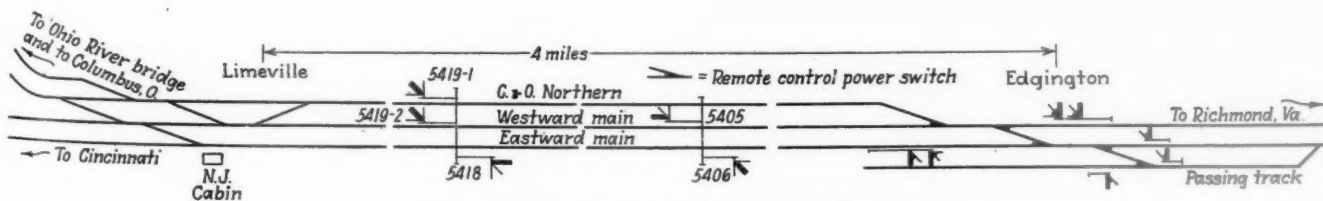
AT EDGINGTON, KY., four miles east of Limeville, the Chesapeake & Ohio has replaced a 24-lever mechanical interlocking with power switch machines and signals, which are remotely controlled by a C.T.C. type machine in the tower of the interlocking at Limeville, at which point a double-track line diverges from the Richmond-Cincinnati main line to cross the Ohio river, and extends northward to Columbus and Toledo, Ohio. From Limeville a third main track extends eastward to Edgington; westbound destined for the Columbus line are diverted to this third track at Edgington.

This section of third main permits northern subdivision freight trains to leave the main line quickly, especially when interchange movements are to be made or when helper engines are to be attached to assist trains up the grade leading to the bridge over the river. The track layout at Edgington includes a trailing-point cross-over between the two main tracks, a facing-point cross-over from the eastward main track to a passing track, and a facing-point turnout from the westward main track to the third track, designated as track No. 1.

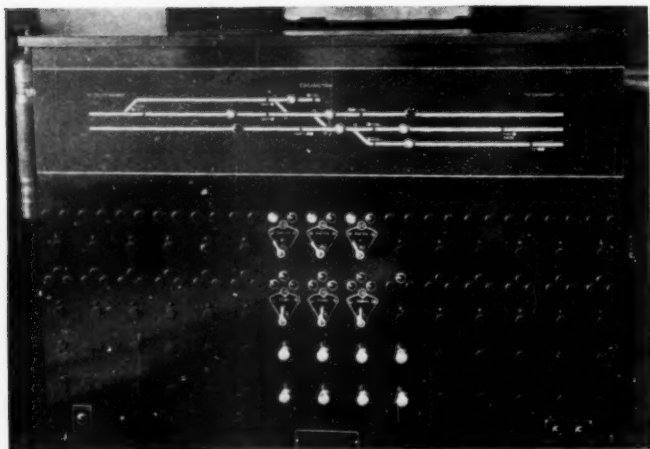
A study of operating conditions between Russell terminal and Limeville revealed that the Edgington interlocking station, which was originally built in 1911, was no longer essential. It was, therefore, decided to

remove the old mechanical plant, install power switch machines and signals and control the layout by means of centralized type of equipment, operated from a C.T.C. machine in the existing interlocking tower at Limeville. At the same time obsolete and worn out two-position automatic semaphore signals, for a distance of seven miles east to Riverton, Ky., were replaced with three-position automatic color-light signals, properly spaced to provide adequate braking distance.

The daily traffic through Edgington includes 10 passenger trains, 10 manifest freight trains, 2 local freight trains and about 28 ordinary freight trains, totaling about 50 trains daily. As mentioned previously, westbound freight trains for Columbus diverge from the main line at Edgington. In addition, Edgington is a point of interchange. For example, eastbound trains from Stevens yard, a short distance east of Cincinnati, with loads destined for the lake ports via Columbus, are routed by means of the power switches into the eastward siding at Edgington, and the loaded cars are left in the siding to be picked up by westbound northern subdivision trains. Likewise, eastbound trains from Columbus, with cars destined to Cincinnati and the west, leave them on the eastward siding at Edgington, to be picked up by westbound trains for movement over the Cincinnati division. Approximately 100 loaded and 100 empty cars



Track and Signal Plan of Edgington Remote Control



The Control Machine Is Located in the Tower at Limeville

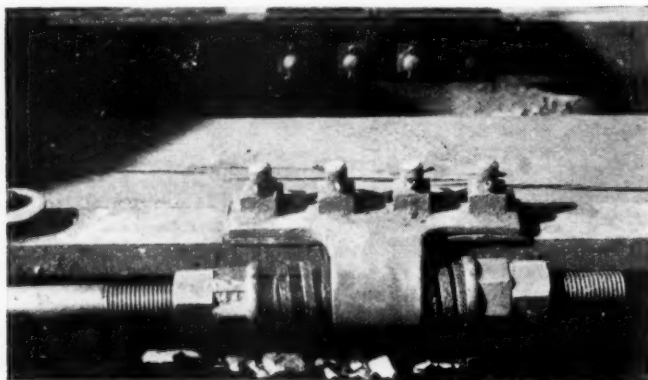
are thus interchanged daily at Edgington, during nine months of the year.

As many of the movements in picking up or setting out cars block one or both of the through main tracks, they must be handled without delay. The operator at Limeville is, of course, fully informed in advance as to the moves to be made at Edgington, and he co-ordinates the operation of the Edgington layout with that of the Limeville plant as though it were all one interlocking. Operations are thus facilitated by centralizing the control of the entire area under the direction of one man who can co-ordinate the movements. Although telephones are provided at Edgington, a large proportion of the movements are made without the trainmen talking to the operator at Limeville. If the operator desires to call trainmen to the telephone he sounds a large electric horn.

Equipment Required for the Change

The major items of equipment installed at Edgington to replace the mechanical plant included five electric switch machines, five interlocking color-light dwarf signals and two two-arm interlocking home signals, one of which is a standard color-light type and the other a two-arm semaphore of comparatively modern design. The latter, which formerly served as the westward home signal was retained in service. All signals are located immediately to the right of the track governed, standard two-arm high signals being provided for all through train movements in the normal direction of traffic. Color-light dwarf signals with three aspects are used to control low-speed movements through the crossovers to the main tracks with the normal direction of traffic.

The control machine in the tower at Limeville, for the control of the switches and signals at Edgington,



Special Springs on the Throw Rod Facilitate Adjustment

has three two-position levers for the control of the switches and three-position levers for the control of signals. These levers, together with an illuminated track diagram, are mounted in a standard 30-in. sheet-metal cabinet which affords spare spaces for extensions of the C.T.C. system in either direction. The time code system of control is used, all functions being controlled and indications returned by codes transmitted over a single-line circuit of two wires.

Aside from the C.T.C. machine, no other equipment was added in the tower at Limeville except the code-line and code-operating batteries and their rectifiers. Code equipment at the instrument house at Edgington consists of one line-coding unit and three storage units.

Switch Layouts

Each power switch is operated by a Type-M2 switch machine equipped for operation on 24 volts d-c. Each machine is equipped with a point detector, and Chesapeake & Ohio standard switch fittings and braces are used throughout. Each switch adjuster is equipped with two coil springs, as shown in the accompanying illustration. The springs are made of spring steel of $\frac{5}{16}$ -in. square section and are formed with $1\frac{3}{4}$ -in. inside diameter. The purpose of the springs is to reduce the wear and strain on parts when the switch operates, as well as to compensate for binding in the switch machine due to normal irregularities in alinement and fitting of switch points. This spring arrangement is, therefore, a decided benefit in preventing switch failures and reducing maintenance costs. Extended tests on the Chesapeake & Ohio have shown that they are especially valuable on remotely-controlled layouts where the maintainer is not on duty to make frequent observation of the switches during extreme changes of temperature.

This entire installation was planned and installed by the signal forces of the Chesapeake & Ohio.

New Executives of General Railway Signal Company

(Continued from page 362)

was organized, with his father, Henry Johnson, as president, he became its signal engineer. In 1899 he returned to the Union Switch & Signal Company and, after a brief assignment in its New York office, he was appointed engineer of construction for the eastern district; later he was for two years at Swissvale, Pa., as signal engineer in charge of the estimating and cataloging departments. He was then transferred to New York to take charge of installing the signaling system on the Interborough subway system and of other large installations put in at that time, such as the Pennsylvania terminal, New York. When this work was finished he was made eastern manager in charge of sales and construction. About 1910 he was appointed general sales manager, and in March, 1914, he became vice-president in charge of sales and engineering.

The following July Mr. Johnson left the service of the Union Switch & Signal Company to become vice-president and director of the General Railway Signal Company, serving in that connection until 1920 when he became president of the Johnson Railway Supply Corporation of New York. On January 1, 1927, he returned to G. R. S., serving as special representative until November of that year when he was appointed assistant to the president—the position he held until his recent election as vice-president in charge of sales.

The Spectre of Public Ownership*

Can politicians operate railroads as efficiently as
trained employees have in the past?

By Fitzgerald Hall

President, Nashville, Chattanooga & St. Louis

WHILE there has been in the last few months some improvement in the financial status of American railroads, by reason of increased public patronage, yet the American railroad system as a whole, representing an investment by the people of about \$25,000,000,000, is not now and for several years last past has not been a self-supporting industry. In other words, the railroads have not been able to take in from the selling of transportation service enough to pay all of their essential costs, including taxes and interest on borrowed funds, but not including dividends.

As a partial result of this unhappy situation, there are some who suggest that the solution of the railroad problem in this country is ownership and operation of all railroads by the government of the United States. The viewpoint of those who so express themselves seems to be either that federal ownership and operation is inevitable, or that, in any event, it is desirable. Let us consider these two points of view somewhat separately.

Can Politicians Solve the Problem

One of the reasons advanced as to the ultimate necessity of such government ownership and operation is that, while the railroad plant of America, in general, is indispensable, both as a matter of economics and national defense, still the men who have been running the railroads have been "asleep at the switch," so that private citizens running the railroads may no longer be trusted to meet modern competitive conditions in a sensible and economic way and that, therefore, inevitably the people's railroad should be turned over to politicians to operate.

Growing out of this contention or suggestion, inevitably arise three questions of fact: (1) Is the railroad industry a decadent one and has it been asleep?; (2) What is the cause of the present railroad situation and to what extent are the representatives of the owners in managerial capacity responsible for that situation?; (3) Is there a remedy other than federal ownership and control and, if so, what is it?

Let us take up these three questions of fact separately.

(1) Everybody knows, in general, about the innovations in air, water and motor transportation, though relatively few realize that it is the tax-paying public which, in large degree, has made such improvements and operations possible. There has not been a great deal of publicity, I think unwisely, about what the railroads have done in recent years to improve their service, so let me give you a few facts for your consideration.

(a) The volume of freight traffic in America handled by the railroads in 1934 was substantially the same as it was in 1922. But we have learned a lot in that 13-year period. We have learned how to treat ties to make them last longer. We have learned to fabricate better rail, and particularly to harden the ends to prevent wearing at the joints. We have developed modern appliances, such as roadway cranes, ditchers, tie tampers, weed destroyers, and the like. And what has been the result? Whereas, in 1922 it cost the American railroads to maintain their roadway and structures a little over \$2,000,000 a day, as a result

of experience and study and the consequent economies that cost was reduced in 1934 to approximately \$1,000,000 a day; and yet, in the face of this cost reduction of 50 per cent, we are running heavier and faster trains, with greater safety than ever before.

(b) We have learned that bad water can make a steam locomotive sick, just as impure water can make an individual ill. And so, taking advantage of the studies of our chemists and other technicians, we have reduced the cost of utilizing water in steam locomotives in the last 15 years by a sum of about \$50,000,000 a year.

(c) Since 1922 we have increased the average speed of all freight trains on Class I roads 41.5 per cent. As I stated above, the freight traffic on American railroads in 1922 and 1934 was substantially the same. Yet, in 1934 the railroads handled this freight business with 25 per cent fewer trains, with a consumption of 34 per cent less fuel, and decreased the running time per 100 miles, on the average, by 2½ hr.

(d) A modern steam locomotive, compared with the best of 20 years ago, will operate 33 per cent faster, consume 33 per cent less fuel and produce a drawbar pull of 33 per cent more. The average tractive power of a modern steam locomotive, as compared with the best known before 1915, shows an increase of 100 per cent. So, the horsepower of a modern steam locomotive, as compared with the best of the 1900 period, has increased over 400 per cent.

(e) While some steam locomotives built 15 or 20 years ago for passenger service were capable of very high speeds, yet the railroads as a whole, for various reasons, did not avail themselves thereof until about the last two or three years. Today the American railroads are giving the finest and most comfortable passenger service in their history; and not only are the appointments of modern passenger trains better calculated to serve the comfort of railroad passengers, but trains are being operated with a safety known to no other form of transportation. All one need do is to scan the daily papers to see the appalling loss of life to those using other forms of transportation, while in the whole year of 1935 not a single passenger on an American railroad was killed.

With this record of achievement, I challenge the accuracy of the suggestion that the railroads have been asleep.

Five Factors Contribute to Financial Situation

(2) If, therefore, it be a fact, as it is, that railroads are giving better, faster and safer service at a low cost to the public, what is the reason for their general desperate financial situation? There are five factors, as follows:

(a) The general depression, which has been world-wide.

(b) In spite of all our talk about national planning, under which the politicians will see to it that the plain citizens will not produce more than the public can reasonably consume, use or sell abroad, and thus avoid unnecessary surpluses, government—state and federal—has, out of public funds, largely borrowed, been constantly adding to the existing facilities of transportation by air, water and motor transport. The result is that America today has a large surplus of transportation facilities, and, in the face of that fact, government continues to spend about \$2,000,000,000 a year out of the public purse—largely borrowed, I repeat—to increase facilities for transportation by air, water and motor vehicle which the people do not need. Thus, so great is the entire transportation machine that no form as a whole, without government subsidy, can possibly operate at a profit—and all forms, except the pipe lines and the railroads, are the direct beneficiaries of regular and large subsidies.

(c) The railroads do not object to and have no fear of competition. Their only complaint in this respect—and it is thoroughly justified, both in economics and ethics—is that government—state and federal—is discriminating against the railroads, both in the matter of regulation and taxation. All the railroads ask in this respect, all they are entitled to ask, is that competi-

* From an address at the annual dinner of the Traffic Club of Chicago.

tion be on a fairly equal basis. And the failure to put competition on such an equal basis has put the railroads at a tremendous disadvantage in the matter of costs of operation and the rendition of public service, with the consequent impairment of their revenues, gross and net.

(d) The Congress of the United States is constantly burdening and hamstringing the railroads. This seems to be done largely because the gentlemen of the Congress are, or seem to be, afraid to deny many of the demands of organized railroad labor. The present boom-time level of railroad wages and many of the existing working rules are the result. Railroad employees are entitled to as full and fair compensation, and as favorable working conditions, as the nature of the business reasonably admits, but they are not entitled, as a class, to special and preferred treatment at the expense of the equal rights of the owners and the rate-paying public. There are pending in the Federal Congress today bills, sponsored primarily by railroad labor unions, which, if enacted into law, would, within a short time, practically bankrupt every railroad in America. The only reason why railroads are subject to this particular character of treatment is because the Congress is so fearful of the supposed political power of that highly organized minority known as the railroad labor unions. Labor unions, here let me say, have their legitimate functions—they have done and can do much that is good, not only for their own members but for the public as a whole. But, like all other organizations, they are not infallible—they may demand too much. They should be accorded all that they are entitled to—all interests considered—but no more. Further, they, as all others, should be made amenable to the "law of the land."

*I think it only appropriate to say that I realize that railroad management is not perfect. But taken as a whole it is my opinion that railroad management is at least as good as that in any other industry or business in this country. I referred to the fact that Congress, apparently unable to resist the pressure of the labor unions, has passed many laws affecting railroad costs which, in my opinion, are unsound. It is only fair to say also that, in my opinion, railroad management, in yielding to the supposed political, economic and physical power of the labor unions, has acquiesced in some things which should have been fought out. For the railroads to be paying, as they now are paying, basic wages as high as those which obtained during the peak of prosperity is to me an economic absurdity. I favor paying every railroad employee full and fair compensation, but, in determining what is fair, the financial condition of the payor must be considered. If labor insists, as I understand it does, in sharing in prosperity, it must be willing to share proportionately in adversity. In my personal opinion the restoration of the last wage increase not only was economically unsound, but placed railroad employees in a preferred class, instead of according them merely fair and equal treatment.

Everybody knows the difficulties of adjusting railroad wages. Had railroad management declined to restore the temporary cut of 10 per cent to organized labor, I do not know what would have happened. Whether they would have been successful, whether the cost of making a fight might have largely exceeded any possible benefit, I do not know. But I do believe that those in managerial positions, who are nothing but trustees, should have the courage to make a fight, even against overwhelming odds, for that which is fair and right. And I further believe that the American people as a whole should and will support either labor unions or railroad management in any controversy in which that which they advocate is based on common sense, justice and sound economics. Peace and harmony are always desirable, but there are times when the price paid may be too great. We can always get along with those who differ with us if we give them all they ask for. But, in so doing, we not only solve no problems but really make matters worse.

(e) Because transportation is of such vital importance to every individual and business, it is, to use the language of the lawyers, "affected with a public interest." Naturally and properly, therefore, there should be public regulation. One reason why public regulation has produced such unsatisfactory results is that most of the men occupying public positions of regulatory character have had no prior training and experience in the highly technical work which they are appointed by law to supervise. Just as a man of fine character, sensible, honest and public-minded, is not by these splendid attributes alone able to successfully perform a surgical operation, so our regulatory officials cannot best perform their technical duties unless, in addition to general good character and ability, they also have specialized training and practical experience.

These five factors—the last four are certainly man-made and easily preventable and remediable—have caused the present chaotic situation in the transportation industry of this country, and more particularly the unfortunate plight of the American railroad plant as a whole.

*This and the following paragraph were taken from a subsequent address by Mr. Hall on the same general subject.

(3) Assuming for the moment that government ownership and operation of railroads is not the remedy, then what is the remedy? First, what is the real trouble? The present situation is simply the natural, proximate and inevitable result of shortsightedness, unfairness and inefficiency in governmental treatment and regulation. What, then, is needed to prevent government ownership and operation from being inevitable? The answer is very simple. It requires only two things: (a) A good-faith and intelligent observance of that sound old-fashioned doctrine, for many years, unhappily, more honored in the breach than in the observance of "equal rights to all and special privileges to none"; (b) the appointment of men in public place, exercising regulatory functions, who, in addition to good character, common sense and patriotism, will have the added characteristics of specialized training and experience. If the American people have the good judgment to require of their public servants conformity to these two simple elemental principles of political philosophy and economics, the American railroad industry as a whole can and will be self-sustaining, and government ownership and operation will be neither inevitable nor necessary.

We then come to the second major proposition. Regardless of everything else, is government ownership and operation desirable *per se*? Let us consider this proposition from three standpoints: Principle, experience in other countries and the reasonably to be anticipated results of the adoption of such a national policy.

(1) The American system of government differs in large degree from governments of the world generally. The theory of most governments other than our own is that the people are not competent to rule and, therefore, there should be a strong centralized government with practically supreme power in the hands of a few chosen individuals. The American system is based upon the sound idea that the people are competent to rule themselves; and that their public servants must exercise only such limited and restricted powers as the people specifically vest in them. The American system is based upon the conception that each person, individual and corporate, shall be free to exercise his own judgment and to run his own business in his own way, subject to such limited and reasonable restrictions as are best calculated to prevent some selfish and willful individual from transgressing the proper rights of his fellow citizens.

So it is under the American system, whether it be good or bad—personally, I think it the best yet devised by man—that business is the function of the individual, and it is no more the function of the federal government to run the railroads than it is for it to run the newspapers, the schools, the labor unions, the churches, the banks and every human activity.

(2) Let us pass for the moment from the question of principle and consider merely the experience of others. There has been and is now in many different countries government ownership and operation of railroads. Speaking generally, the result has been an economic failure in them all. In Canada there are two great railroad systems—one owned and operated by the government, the other owned by private individuals and operated by their chosen representatives. The former, the Canadian National, has never in any year earned enough to pay the interest on the money borrowed from the people to build the railroad plant. On the average, it has been operated at an annual deficit of over \$6,000,000. The latter, the Canadian Pacific, has been a very profitable organization.

We can safely say, with absolute accuracy, that, speaking generally, there has been nothing in the experience

of other countries to justify the belief that politically controlled railroads can or will be operated either intelligently or profitably. Our own experience during the federal control period of the great War is convincing evidence of the soundness of this general conclusion.

Probable Results of Government Ownership

(3) We then come to the question of what the American people may reasonably anticipate should we have government ownership and operation of the American railroads. While no man can foresee the future, certainly, resorting to the "lamp of experience," we may, with some degree of certainty, forecast the probable results, and some of them are these:

(a) The politicians would not choose the best qualified railroad expert in America to be in supreme charge of railroad operations, but would choose one of their own number—namely, a politician—for this important technical task.

(b) The personnel of the governmentally operated organization would not be based on either civil service or experience, but on party loyalty and local political influence.

(c) We know that the federal government for years has constructed post offices in size, cost and appointments disproportionate to the needs of most local communities. Congressmen and senators have generally, as we all know, advocated as great an expenditure for such purposes as possible, and the basis for that advocacy has not been essential public service but the effort to be popular by "bringing home the bacon" to those upon whose suffrage their continuation in public office depends.

In exactly the same way we naturally foresee the building of terminals, stations and lines based upon political and not economic considerations. In the same way, endeavoring to pander to local political influences, the centralized political powers at Washington would operate trains and render service based on anything but business and economic considerations.

(d) Yet, all the objections so far mentioned seem to me to fade into insignificance compared to another logical and inevitable result of political control of the railroads. If the politicians get control of the railroads, do you imagine for a moment that they would continue indefinitely to permit competition with the government by private companies operating boats, air lines, pipe lines and motor vehicles? It would only be a matter of time, and short at that, until all forms of transportation would be subject to political operation and control.

Should such a condition eventuate, as it would, where would the average individual and business find itself? The Congress, with its complete control of transportation, could and would dictate the details of every business in America—hours, wages and working conditions, and all the costs, both of production and sale. Already Congress, in existing laws—practically all unconstitutional, I think—is undertaking to limit government patronage to those who comply with its arbitrary political fiat in relation to hours, wages, costs, and the like.

Government ownership and operation of transportation in America would promptly bring about a totalitarian state, with all power vested in the politicians, who would no longer be public servants but public masters, as many even now assume to be.

Who is it, then, at the moment demanding government ownership and operation of the railroads? Two groups primarily: (1) A few politicians, who see in this socialistic venture the opportunity to further entrench themselves in public office, and (2) a few—not all, by any means—of the labor union leaders, who see an opportunity to increase their power and prestige by the exploitation of the American people as a whole, including members of their own organization whom they pretend to represent.

We have had advocates of government ownership and operation of railroads in this country during many periods, but today the situation is somewhat different, because the advocacy of government ownership and operation of railroads is the natural, logical and inevitable result of some of the theories and acts of many now in high authority, or with great influence, in the present national administration. Centralization of power in Washington is and has been the theme song of a large part of the public dignitaries, and their advisers, of the present administration.

New Books...

The Traffic Dictionary, by C. S. Nelson and George T. Stufflebeam. 224 pages, 6 in. by 4¼. Bound in cloth. Published by the Shipping Service Organization, New York. Price \$1.25.

This is the third and "thoroughly revised" edition of this book, which is described in its sub-title as "A Compendium of Domestic and Foreign Trade and Shipping Terms, Phrases and Abbreviations." It consists of two major sections—one covering 2,500 definitions of terms, expressions and abbreviations, and the other an appendix describing and illustrating shipping-room equipment and supplies. The foreword to the latter assures readers that "The publishers have gone to considerable effort in this appendix to eliminate sales propaganda and to present . . . the basic principles and operation of the appliances offered by various manufacturers."

Economic Principles of Transportation, by W. T. Jackman. 891 pages, 9 in. by 5¾ in. Bound in cloth. Published by the University of Toronto Press, Toronto, Ontario. Price \$5.

While this book is based on a previous work by the author, which was published in 1926, it has nevertheless been largely re-written—a procedure dictated by changes in world conditions, and "especially in transportation," which "have altered greatly the entire situation." Thus Professor Jackman presents an up-to-date as well as a comprehensive treatise on all phases of transport; but recognizing withal that "the railways must be our chief reliance as the foundation for the carriage of the great bulk of the freight traffic" he has not hesitated to devote most of his attention to them.

The book opens with a survey of railway developments in Canada and then proceeds through discussions of physical factors in railway operation and railway income and expenditures to several chapters on rates, rate making, freight rate structures of the United States and Canada, and transportation rates and prices. These latter, comprising approximately half of the book, are followed by other chapters considering in turn special railway services, express services and rates, the board of railway commissioners for Canada, government ownership in Canada and recent developments in that field, inland water transportation and highway transportation.

The author, who is professor of transportation at the University of Toronto, has drawn his illustrative material from both the United States and Canada; and, because of the "close relation of these two countries in business and social life," he has "stressed the application of these influences."

Handbook of Fire Protection, Eighth Edition, by Crosby-Fiske-Forster. 1154 pages, 5 in. by 7 in. Bound in red cloth. Published by the National Fire Protection Association, Boston, Mass. Price \$1.

This volume has been compiled with the assistance of an imposing list of fire insurance and fire prevention experts, including W. S. Hickey, president of The Railway Fire Protection Association, and is recommended to engineering and other forces of railroads responsible for fire prevention and protection plans and activities as the most comprehensive compilation of accepted information which has been assembled in one manual. Included in the book are statistics on losses to life and property by fire, descriptions of fire prevention and fire risk organizations, comments on existing laws and regulations, and information on specific hazards.

Separate chapters contain practical data for the engineer on heating appliances, chimneys, internal combustion engines, building details, standpipes, fire extinguishers, sprinkler systems, fire apparatus, hose connections, fire pumps, and alarm systems. Information is presented on the handling of flammable liquids, electric wiring, chemicals and explosives; and on methods of retarding the spread of fires, providing fire protection, handling oil fires, dust explosions, the use of public water supplies, and the protection of records.

The manual also reviews recommended methods of fire inspection, fire investigations and salvaging operations, and furnishes 25 pages of tables of measurements for engineering design. The book is compactly arranged and provides a detailed index for all types of reference work on fire prevention, insurance and fire fighting problems, which have been reduced to codes, formulae, and standard practices.

NEWS

Long-And-Short-Haul Bill Opposed by Co-ordinator

Eastman doubts that railroads would gain anything substantial by proposed repeal

Expressing doubt as to whether the railroads would gain anything substantial from repeal of the long-and-short-haul clause as proposed in the Pettengill bill, H.R. 3263, and pointing out that the Interstate Commerce Commission from 1930 to 1935 had granted fourth section relief asked by the railroads in 120 cases while denying the relief in only 30 cases, Co-ordinator Eastman testified in opposition to the bill at a hearing before the House rules committee on February 26. He favored only the elimination of the "equi-distant" clause of the fourth section, as proposed in his recent report to the President and Congress, and said that while he was speaking only for himself his conclusions were also those of the commission except that two commissioners were opposed to any change in the fourth section.

Mr. Eastman appeared at the request of the committee at a hearing not on the merits of the bill but on the question as to whether the House shall be given an opportunity to vote on the bill as reported at the last session of Congress by the committee on interstate and foreign commerce. Proponents of the bill have been seeking a rule providing for its consideration which the rules committee declined to report until it had heard from Mr. Eastman. Members of the committee and other Representatives who desired to favor or oppose the bill were to be heard on Thursday.

Co-ordinator Eastman's statement followed the general lines of his report. After outlining the history of the long-and-short-haul clause he said that it is now possible for the commission to do under it what the railroads think ought to be done but the railroads think the commission in administering the law has "leaned backward" to help the water lines. On the other hand, he said, those interested in water transportation accuse the commission of being "railroad-minded." If the bill were passed it would be possible for the commission to follow the same policy that it has pursued under Section 4 but it is contended that there would be a sharp change in policy for the benefit of the railroads and it would be strongly argued that Congress intended that the policy should be more favorable to the railroads.

Referring to the argument that the section should be repealed because it is not

applied to the water lines or to motor transportation, Mr. Eastman said that if need can be shown for it, it should be applied to them by all means.

The chief complaint of the railroads, he said, relates to transcontinental rates and the chief complainant is the Southern Pacific, because the commission has very largely denied the relief sought as to transcontinental rates on findings that the proposed reduced rates to the coast would not be reasonably compensatory or that no substantial proof had been offered that the railroads would benefit. "I think it very doubtful whether there would be any substantial gain to the railroads if the bill should go through, taking into consideration the revenue they would lose on traffic they are handling now and the very low rates they would have to meet." In reply to a question from Chairman O'Connor as to the effect on employment, Mr. Eastman said that railroad employment could not be increased unless the effect were to add greatly to the railroad traffic and if this resulted it would be at the expense of employment in other forms of transportation. He also said that if the bill were passed the commission could suspend the proposed reduced rates.

Regarding the time consumed under the present law in obtaining relief from the commission Mr. Eastman said that some of the larger cases have taken a long time but that 78 per cent of the 604 cases before the commission in a recent period were decided in an average of 28 days. He believed that the present policy of the commission is fair to both railroads and water lines and gives the railroads an opportunity to meet water competition when it seems reasonable.

B. C. Member Seeks Lower Domestic Grain Rates

For the fifth time Thomas Reid (British Columbia member of Parliament) last week pressed in the House of Commons at Ottawa the claims of that province for lower freight rates on grain. In moving second reading of his bill to place rates on feed grain into British Columbia on the same basis as the export rates, he declared he would keep on introducing the bill until he got some action. Mr. Reid clashed with Thomas Vien (Montreal), a former Railway Commissioner, who sought to explain the difference between export and domestic freight rates.

The whole system of railway freight rates was "idiotic, chaotic and archaic," said Mr. Reid. If the railway companies did not get rid of some of their "so-called experts" they would find their traffic all being handled by buses and trucks.

Motor Trucking System Planned by Pennsylvania

Contemplated set-up partially disclosed in application filed under motor carrier act

Plans of the Pennsylvania Railroad for developing a system of correlated and affiliated truck operations, co-ordinated with, paralleling and feeding its rail lines, have been partially disclosed in applications filed with the Interstate Commerce Commission under the new motor carrier law by the Pennsylvania Transfer Company of Pittsburgh, part of a group of companies controlled by the Pennsylvania, for authority to acquire control of motor freight lines. Application was recently filed for authority to acquire the business and property of the Chicago-Cincinnati Motor Freight Lines for \$15,000 and this week additional applications were filed for authority to acquire complete stock ownership of the Alko Express Lines for \$162,500 and of the Barker Motor Freight, Inc., for \$25,000.

In the Alko application the Pennsylvania Transfer Company said: "This application is one of several of a similar character being filed by subsidiaries of the Pennsylvania Railroad Company for acquisition of certain truck operations designed in the public interest to further the development of a system of correlated and affiliated truck operations, co-ordinated with, paralleling, and feeding the rail lines of the Pennsylvania Railroad. In a measure this system is, as developed and developing, comparable to that long since developed and accomplished by the Pennsylvania Greyhound Lines with respect to passenger traffic. The actualities and possibilities of truck co-ordination with, and utilization by, rail lines, are of course greater than with the bus. Study and actual experience have already demonstrated this.

"In the development of such a truck system the applicant as a factor therein will be enabled to co-ordinate its service with the Pennsylvania and thus enable it, the railroad, to effectuate greater efficiency in its existing truck-rail co-ordinated service, and also will enable it to be in a position to afford, in the public interest, to its patrons and the general shipping public, alternative or co-ordinated service by truck or by rail or by both, depending, as to the particular movement, either on the requirements of the shipper and the nature of the service involved, or on a determination of the more economical and efficient method of furnishing the trans-

portation service required, or both. Opportunity will be afforded under one general control, and specialized operating managements with adequate financial responsibility, to co-ordinate both agencies of transportation, and to use either or both purely according to the dictates and necessities of sound transportation economics, subject to the plenary jurisdiction, direction and control of the Interstate Commerce Commission, and divorced from other considerations customarily incident to rail and truck operations not under common control and correlated managements."

The Chicago-Cincinnati Lines operate in Ohio and from Chicago to Cincinnati and Erie, Pa. Alko Express operates between Lancaster, Pa., and Pittsburgh, with various branch lines. The Barker company operates in Michigan, Ohio, West Virginia, and Pennsylvania.

The Pennsylvania Transfer application states that it is controlled through ownership of 100 per cent of its preferred stock and 70 per cent of its common stock by the American Contract & Trust Company, the stock of which is entirely owned by the Pennsylvania. The Pennsylvania Transfer also owns the entire stock, \$44,000, of the Excelsior Express Company. The American Contract & Trust Company owns 85 per cent of the stock of the Buffalo Storage & Carting Company, 69 per cent of that of the Merchants' Trucking Company, 100 per cent of that of The Willett Company of Indiana, Inc., and 84 per cent of that of Scott Bros., Inc. Scott Bros. also own 100 per cent of the stock of the Peninsula Auto Express Company.

The commission has assigned the application as to the Chicago-Cincinnati company for hearing at Chicago on March 16 before J. Edward Davey, chief of the section of finance of its Bureau of Motor Carriers.

New York Traffic Club Annual Banquet

The annual banquet of the Traffic Club of New York was held at the Hotel Commodore in that city on February 21. More than 2000 persons attended this dinner at which Representative Hamilton Fish, Jr., of New York was the principal speaker.

Snowslide Sweeps Coach From Track

A passenger and two train employees were believed to have been killed on February 26 when a snowslide swept the coach in which they were riding from the Northern Pacific tracks into a canyon near Wallace, Idaho. The train, consisting of a mail car and coach, was running late in a blizzard from Missoula, Mont., to Wallace.

Advocates of St. Lawrence Waterway Plan Convention

Proponents of the plan for the joint development of the St. Lawrence River's power and navigation facilities by the United States and Canada are promoting a convention to be held at Detroit, Mich., next month. A. O. Moreaux, chairman of the executive committee of the Great Lakes-St. Lawrence Tidewater Association, conferred in New York last week

with representatives of several states which might be expected to benefit from the federal government's expenditures on the development. Plans for the St. Lawrence project have remained dormant since the proposal to ratify the treaty on which the plan rested failed to receive the necessary two-thirds vote in the U. S. Senate.

New England Railroad Club

The New England Railroad Club will hold its next meeting at the Copley-Plaza Hotel, Boston, on Tuesday, March 10, at 6:30 p.m. This will be the fifty-third annual meeting and the election of officers. There is to be no formal paper, but there will be an illustrated talk, with a visomatic machine, on various types of valves used in the railroad field.

Progress in Grade Crossing Program

Contracts for grade crossing projects to the amount of \$2,520,419 were awarded during the week ended February 21, bringing the total up to \$41,395,210. Plans have been approved by the Bureau of Public Roads to the amount of \$74,242,000 in 45 states and the District of Columbia under the \$200,000,000 program.

Norfolk & Western Better Service Clubs—A Correction

The 21 Better Service Clubs of Norfolk & Western employees will hold 224 local meetings at 21 places on that railroad during the next 11 months, according to a schedule announced on February 1. It was reported erroneously in the *Railway Age* of February 15, page 291, that there were 224 of these Better Service Clubs on the N. & W.

Swiss Railroads Plan to Improve Local Passenger Service

In an endeavor to meet highway competition, the Swiss Federal Railroads plan to inaugurate several improvements in their local passenger train services when the new 1936-37 timetables become effective on May 15. Through the substitution of straight passenger trains for mixed trains, services on several routes will be materially expedited.

The new timetable, for example, contemplates three different kinds of local passenger service as follows: (1) Light trains carrying only passengers, baggage, express and mail, and making only 30-second stops at intermediate stations. (2) Accelerated local passenger trains with reduced auxiliary duties and increased speeds and shorter station stops. (3) Regular local mixed trains.

Pick-Up and Delivery Service in Wisconsin

The Wisconsin Public Service Commission, on February 20, vacated its suspension of pick-up and delivery service which the railroads intended to place in effect on January 20 and the service is now available through arrangements made previously with drayage concerns. When the railroads attempted to establish free pick-up and delivery service on l.c.l. freight shipments within Wisconsin, trucking interests sought to prevent the introduction of the service. The commission suspended

the arrangement for a 30-day period and conducted a hearing on the subject in Madison on January 24, at which representatives of the railroads and Wisconsin shippers were heard.

Train Theft in Newark, N. J.

Three armed men forced open the doors of four box cars of a Pennsylvania train, while it was on a siding at Newark, N. J., on February 24, and stole a quantity of cosmetics and other merchandise. One of the men held the conductor, who discovered them at work, a prisoner with a revolver while his accomplices completed the transfer of the merchandise to a waiting truck. The train—a fast freight of six cars—was bound from Philadelphia to New York and had taken the siding to await the passing of a passenger train. When the trio sped away in their truck the conductor sounded the alarm but police were unable to find any trace of the robbers or their truck.

Transportation Drama at Great Lakes Exposition

A pageant depicting the development of transportation in the Great Lakes region will be a feature of the Great Lakes Exposition to be held at Cleveland, Ohio, from June 27 to October 24. The transport drama is now being prepared by Edward Hungerford, who wrote and directed the "Wings of a Century" at the Chicago Century of Progress Exposition.

Representative Fish Opposes Government Ownership

The idea of government ownership of the railroads was vigorously opposed by Representative Hamilton Fish, Jr., of New York, in an address before the Washington, D. C., Transportation Club on February 20. "I am opposed to all forms of government ownership, and particularly to government ownership and operation of the railroads," he said. "Government ownership would be a step backward. It would just mean the building up of a huge bureaucracy in Washington. It is the first step toward socialism."

Shippers' Board Meetings

The following shippers' advisory boards will hold meetings during March: Southwest, at Beaumont, Tex., on March 5; Trans-Missouri-Kansas, at Kansas City, Mo., on March 11; Allegheny, at Pittsburgh, Pa., on March 12; Ohio Valley, at Columbus, Ohio, on March 17; Southeast, at Birmingham, Ala., on March 19; Pacific Coast, at Los Angeles, Cal., on March 20; and Great Lakes, at Toledo, Ohio, on March 25.

The meeting of the Southwest shippers will be preceded by a luncheon under the auspices of the Sabine District Traffic Club and the Beaumont Lions' Club. Guest speakers will be Colonel Ernest O. Thompson, chairman of the Texas Railroad Commission, who will speak on Modern Transportation Regulations; M. J. Gormley, executive assistant of the Association of American Railroads, on The Present Transportation Trends; Victor H. Schoffelmayer, agricultural editor of the Dallas News, on The Farm Chemurgic Move-

ment—New Industries from Agricultural Products; and Frank A. Leffingwell, secretary of the Texas Industrial Traffic League, who will talk on National Transportation Legislation.

Emergency Freight Charges Ordered In Minnesota

Following its report of February 10 finding undue discrimination against interstate commerce in the failure of the Railroad and Warehouse Commission of Minnesota to permit increases in intrastate rates corresponding to the emergency surcharges authorized by the Interstate Commerce Commission the federal commission has issued an order requiring the addition of the emergency charges by March 30.

Big Four and B. & O. Trains Collide at Cincinnati

A baggageman was killed and more than 50 persons were injured on February 23, when a Cleveland, Cincinnati, Chicago & St. Louis passenger train, inbound from Chicago, ran into the rear end of a Baltimore & Ohio passenger train from St. Louis, Mo., as the two were entering the Union terminal at Cincinnati. The collision occurred on a trestle within a quarter of a mile of the place where two passenger trains collided on January 31.

S. P. of Mexico Strike Called Off

A strike scheduled to start at noon on February 20 on the Southern Pacific of Mexico was called off on that day when employees and officers of the company reached an agreement. The employees, on February 11, sent an ultimatum to the company declaring they would go on strike on February 20 unless the company agreed to sign a collective labor contract, settle all pending labor disputes, pay pensions and make a general wage increase. The men involved include all train, yard, shop and office employees.

G. W. Laird Assistant Secretary, I. C. C.

The Interstate Commerce Commission has appointed George W. Laird assistant secretary of the commission, vice Thomas A. Gillis, deceased, effective March 1. Mr. Laird entered the service of the commission in November, 1910, from New Jersey. He was appointed assistant chief of the Section of Dockets in January, 1920; assistant to the chief examiner in July, 1928; and assistant chief, Section of Complaints, Bureau of Motor Carriers, on November 1, 1935.

Express Shipments as Indices of Business Conditions

The Railway Express Agency handled last year 11.6 per cent more shipments than in 1934, according to figures recently made public by President L. O. Head. Business of the Eastern departments increased 12.2 per cent; Central departments, 13.1 per cent; Southern departments, 10.9 per cent; and Western departments, 8.7 per cent.

Mr. Head continues to say that "long experience has taught us that number of

shipments handled is a very good barometer of business conditions," and on such a basis, he adds, in 1935 the Central states led in business improvement, with Eastern, Southern and Western states following in turn. Reports for December, however, indicate some shifts in these relative positions, so that it may be inferred that "toward the end of the year, and at least for the immediate future, relative rapidity of business improvement in the different sections was and will be in the following order: Eastern, Central, Western and Southern."

Steam Railway Accident Statistics November, 1935

The Interstate Commerce Commission's completed statistics of steam railway accidents for the month of November, 1935, now in preparation for the printer, will show:

Item	Month of November 1935		11 months ended with November 1935	
Number of train accidents	583	458	5,895	5,491
Number of casualties in train, train-service and non-train accidents:				
Trespassers:				
Killed	186	167	2,571	2,504
Injured	197	197	2,888	2,992
Passengers on trains:				
(a) In train accidents:				
Killed	11	..	1	12
Injured	31	22	351	311
(b) In train-service accidents:				
Killed	1	1	17	15
Injured	109	115	1,355	1,347
Travelers not on trains:				
Killed	1	3	8	12
Injured	61	53	572	603
Employees on duty:				
Killed	44	43	492	477
Injured	1,361	1,339	14,809	15,511
All other non-trespassers:†				
Killed	180	175	1,579	1,471
Injured	606	577	5,385	5,260
Total—All classes of persons:				
Killed	413	389	4,668	4,491
Injured	2,365	2,303	25,360	26,024

* Train accidents are distinguished from train-service accidents by the fact that the former cause damage of more than \$150 to railway property.

† This fatality resulted from the explosion of a heater in a passenger coach of a standing train.

‡ Casualties to "Other nontrespassers" happen chiefly at highway grade crossings. Total highway grade-crossing casualties for all classes of persons, including both trespassers and non-trespassers, were as follows:

Number of accidents	412	392	3,408	3,283
Persons:				
Killed	174	168	1,460	1,377
Injured	486	438	4,052	3,775

Adverse Weather in Canada

The Canadian railways in the past few weeks have been fighting adverse weather conditions equal to, if not worse than, those south of the international boundary. Last week on the Hornpayne division of the Northern Ontario district of the Canadian National the thermometer ranged from 15 deg. to 58 deg. below zero. On the Southern Ontario district drifting snow varying from 4 ft. on the level to 16 ft. in cuts had to be contended with.

"We have had scores of reports from various sections of the central region," said W. A. Kingsland, vice-president of the C. N. R. at Toronto, "which indicate that had not the railways treated their responsibilities seriously and made titanic ef-

forts to maintain their traffic, large numbers of towns and villages would have been faced with a critical situation from lack of supplies, especially as reports intimate that the highway services ceased to function. In many instances, particularly in remote sections of branch lines, highways have been blocked for lengthy periods and, with the exception of telegraphic and radio services, the railway was the only method of keeping them in touch with the outside world.

"But for the railways Montreal would have suffered an acute milk famine, and the same situation applies to other communities in Quebec. In southwestern Ontario the railways also prevented serious foodstuff shortages by their continuation of service."

Some idea of the work the railways have been called upon to perform in the face of adverse conditions is indicated by the fact that during a 10-day period livestock shipments increased by 50 per cent, and merchandise, including certain types of foodstuffs, increased 25 per cent. Miscellaneous shipments, but which include food necessities, increased proportionately, and milk shipments throughout the region jumped to an unusually high level.

General Overhauling for Flying Yankee

The Boston & Maine-Maine Central streamlined train, "Flying Yankee," will be taken out of service from March 14 to April 1, and sent to the B. & M.'s Billeterica shops for general overhauling. A steam-operated train will take its place. The Flying Yankee has been in operation since April 1, 1935, making, in Boston-Portland-Bangor service, 740 miles a day, with a record of having completed over 95 per cent of its assigned runs. The mileage already made by this train is more than 250,000.

Truck Enthusiast May Be Next Ontario's Premier

Highways are more indispensable than railways to Ontario, Minister of Highways T. B. McQuesten told the Ontario Motor League at its annual dinner in Toronto last week, and the province will not permit regulation of the truck and bus business to get outside of the province's control. Mr. McQuesten is slated to succeed Hon. Mitchell Hepburn as Premier of Ontario when the latter retires.

"There is no justification for a prominent railroad man to suggest the other day that we would do well to require the freight and passenger business on our highways to develop along parallel lines with the railroad," Mr. McQuesten declared.

"My understanding of the railway's suggestion would mean that we adopt the course which has brought the railways to their present condition, that is to say that we impose tolls upon the public to the limit of the public's capacity to pay. Railways are charging too much for their services and the Public has been driven to accept other methods of transportation.

"The railways now say to the highways: 'Adopt our methods, come in with us, create a further monopoly by a system of

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fixed rates and we can all live—off the public."

"I want to point out that in the maintenance of the two services, the highway is becoming the senior and most important service," he said.

Program for A. R. E. A. Convention

The American Railway Engineering Association will hold its thirty-seventh annual convention at the Palmer House, Chicago, on March 10-12. All sessions will be held on Chicago Daylight Saving Time, one hour faster than Central Standard Time. The program for this meeting is as follows:

Tuesday, March 10, 9 A.M.

President's address—Robert H. Ford
Report of Secretary—E. H. Fritch
Report of Treasurer—A. F. Blaess
Reports of committees on
Standardization
Roadway
Stresses in Railroad Track
Yards and Terminals

Afternoon Session

Reports of committees on
Water Service
Signals and Interlocking
Electricity
Economics of Railway Operation
Economics of Railway Labor
Adjournment at 4 p.m. to visit the exhibit of the National Railway Appliances Association at the Coliseum.

Wednesday Morning

Reports of committees on
Ballast
Ties
Rail
Track
Complete Roadway and Track Structure
Wood Preservation

Wednesday Afternoon

Reports of committees on
Iron and Steel Structures
Live Load and Impact
Economics of Bridges and Trestles
Wood Bridges and Trestles
Masonry
Waterproofing of Railway Structures

Thursday Morning

Reports of committees on
Highways
Waterways and Harbors
Records and Accounts
Uniform General Contract Forms
Maintenance of Way Work Equipment
Economics of Railway Location

Thursday Afternoon

Reports of committees on
Clearances
Buildings
Shops and Locomotive Terminals
Rules and Organization
Closing Business

On Wednesday evening, March 11, the Western Railway Club will present its annual engineering night at the Hotel Sherman. Following a Dutch Treat dinner at 6 o'clock, Robert Faries, assistant chief engineer—maintenance—of the Pennsylvania, will present a paper on "The Importance of Track Structure in Railroad Transportation."

Extension of Eastern Time Zone

A hearing on the question whether the limits of the eastern standard time zone should be moved westward to include Chicago or any of the remainder of the state of Illinois or any portion or all of the states of Michigan, Ohio, Indiana or Wisconsin, was opened by the Interstate Commerce Commission at Chicago on February 24, Commissioner Clyde B. Aitchison presiding. The reopening of the time case follows a request from the city of Chicago that the railroads operating in Chicago be required to use eastern stand-

ard time when a city ordinance places that city on eastern time, effective March 1; and the desire of other communities to be heard on the question of the propriety of the proposed change.

During the first day of the hearing, the city of Chicago presented evidence favoring the application of eastern time on railroads in Chicago. On the second day, witnesses for interests in Michigan testified in support of the request that the eastern standard time boundary in Michigan be moved westward. C. E. Elerick, traffic commissioner of the Grand Rapids Association of Commerce, suggested that the boundary of the eastern time zone be moved westward to a line from Cincinnati through Indianapolis, Ind., to Danville, Ill., by way of the Cleveland, Cincinnati, Chicago & St. Louis, thence along the line of the Chicago & Eastern Illinois to St. Anne, Ill., thence through Kankakee, Ill., and Joliet, to include the Chicago switching district. As an alternative plan, he suggested that the eastern time zone be extended to include the area west of Lima, Ohio, and north of the Erie's line to Chicago. Upon cross-examination, he said he would like to see the eastern time zone extended to the Mississippi river.

Opposition to the extension of the eastern time zone to include Chicago was voiced by certain Chicago and Wisconsin interests, the testimony of their witnesses being designed to show the adverse effect of the time change on other territories. A. R. McDonald of the Public Service Commission of Wisconsin took the stand for that body, the State Federation of Labor and the Wisconsin Manufacturers' Association, to show that because Chicago is the greatest market for Wisconsin products and purchases by interests in Wisconsin, it is important that the boundary of the eastern time zone be not extended to include Chicago.

Date for Filing Motor Tariffs Again Postponed

Acting under authority given in the motor carrier act to postpone the effective date of any part of it, the Interstate Commerce Commission, by Division 5, on February 21 entered an order further extending the effective date of Sections 216, 217, and 218. These sections deal with the publication and filing of tariffs and schedules showing rates, fares, and charges for the transportation services performed by motor carriers subject to the act and the effect of the order is to require that tariffs and schedules be filed with the commission on or before March 23, instead of by March 2, the date set in the previous postponement order, although there is no change in the date when the tariffs become effective, April 1.

This action was taken, the commission announced, in response to the earnest requests of numerous motor carriers and their associations that additional time be granted them in which to prepare and file their tariffs and schedules of rates. A petition received two days before from American Trucking Associations, Inc., had asked for a postponement for the full limit under the law, March 31. The law does not provide for postponement of any pro-

vision beyond that date and the commission in its notice called attention to the fact that "this is the limit of the commission's authority to extend the effective time of any provision of the motor carrier act." The petition had proposed that the tariffs be permitted to become effective on only one day's notice. The fact that they will become effective after having been filed and officially open to public inspection for only a few days instead of the usual 30 days is of less importance than it would be in the usual case because under the law the commission may not suspend any of the initial tariffs.

Accompanying the petition containing the request for postponement the trucking association submitted a summary of communications it had received from 76 organizations, bureaus, associations and individual operators favoring postponement. The dates suggested ranged from March 9 to April 1. It was stated that "the industry in the main will find it an extreme hardship, and in many instances an actual impossibility, to comply with the previously established requirement that tariffs and schedules be on file by March 2."

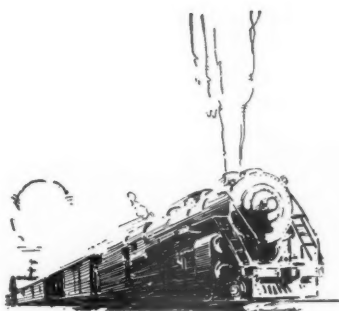
The commission has assigned for hearing at Washington on March 11, before Division 5, the matter of security for the protection of the public as provided in Section 215 of the motor carrier act, and of rules and regulations governing the filing and approval of surety bonds, policies of insurance, qualifications as a self-insurer or other securities and agreements by motor carriers and brokers subject to the act. The Bureau of Motor Carriers has prepared and circulated among interested parties a tentative draft of the proposed regulations which has aroused a storm of protest among the motor carriers on the ground that the requirements are too strict. The hearing will be for the purpose of taking such pertinent evidence in regard to this matter as any interested party may wish to present. Following the taking of evidence, opportunity will be given for oral argument, and it is hoped that it will be possible to have the oral argument immediately after the hearing.

The commission's first hearing on the application of a bus company for a certificate to engage in interstate operations was begun at Washington on February 24 before Director Rogers of the Bureau of Motor Carriers on the application of the Pan-American Bus Line, of Charlotte, N. C., to operate between New York and Miami via Washington.

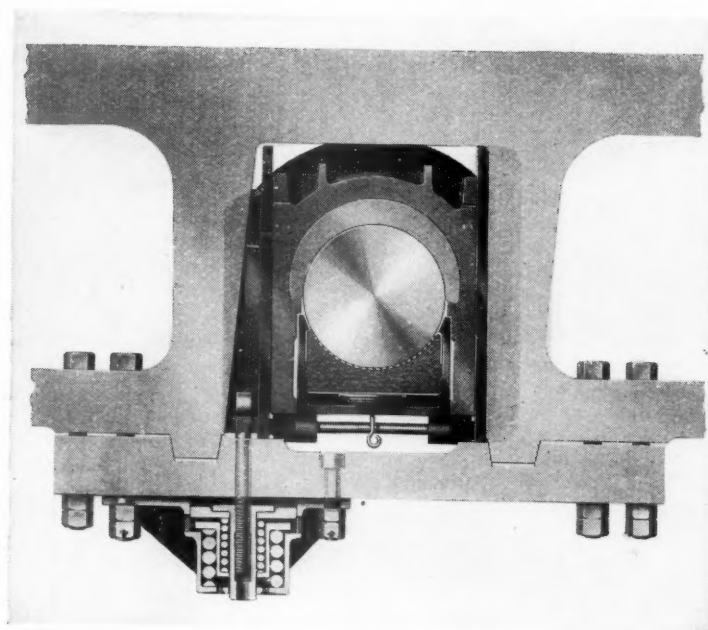
The number of applications received by the commission for certificates, permits, and licenses under the "grandfather" clause is unofficially estimated at about 100,000.

Arrangements have finally been made under which the commission hopes to be able to retain the Bureau of Motor Carriers in its own building, instead of transferring it to a rented building outside the Washington business district in which space was allotted to the commission some weeks ago. A rearrangement has been made by which some of the space in the commission's building occupied by other government agencies will be given up and the new Railroad Retirement Board has been allotted the space at Tenth and U streets to which it was proposed for a time to transfer the motor carrier bureau.

Continued on next left-hand page



MAINTAINS DRIVING BOX PEDESTAL FIT...



AS ACCURATE AS ROLLER BEARING FIT

To get full benefit from roller bearings on driving axles the boxes must be fitted between the frame members to very close tolerance and this fine tolerance must be constantly maintained.

The Franklin Automatic Compensator and Snubber is specially designed to maintain an accurate fit between driving box and frame members at all times. It compensates for wear, provides a yield-

ing resistance to unusual shocks and allows unrestricted freedom of vertical movement of the box.

It maintains the driving box to frame adjustment at the same fine tolerance as the roller bearing itself—a condition essential to maximum effectiveness and economy of locomotive operation. It permits restoring original tolerances without refitting.



Franklin repair parts use jigs and fixtures that insure interchangeability, long life and dependability of service. Genuine Franklin parts are a guarantee of maximum trouble-free service.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK

CHICAGO

MONTREAL

Equipment and Supplies

Norfolk & Western Improvement Program

The Norfolk & Western will spend \$5,000,000 on an improvement program including the construction at Roanoke, Va., shops of 1,000 coal cars and 5 Mallet locomotives; extension of yards at Roanoke, and at Williamson, W. Va., and additional sidings and yard facilities on its Buchanan branch. This road will also purchase 20,000 tons of steel rail.

Milwaukee Improvement Plan Accepted

A \$9,344,423 improvement budget for the Chicago, Milwaukee, St. Paul & Pacific was authorized by the federal district court at Chicago on February 24. Of the amount authorized, the road will spend \$2,116,000 for rails, \$692,000 for rail fastenings and \$523,000 for ballast. New rails will be installed at various places between Milwaukee, Wis., and the Twin Cities, between Chicago and Omaha, Neb., and in Iowa and South Dakota.

Improvements and repairs costing \$1,507,000 will be made on 652 bridges and culverts, while \$2,154,000 will be spent on the widening of cuts and for signaling.

Air-conditioning installations will cost about \$453,000. The balance will be spent on miscellaneous improvements.

Missouri Pacific Program

The Missouri Pacific will continue its program of air-conditioning passenger equipment on a schedule providing for the conditioning of substantially all Pullman and coach equipment by July 15. While all principal trains are now so equipped, this year's program, when completed, will find practically every regular car in service air-conditioned and only a few remaining extra cars to complete the entire program. Approximately \$918,000 will be expended this year in air-conditioning 93 additional passenger-carrying cars, of which 60 are railroad-owned and 33 are the property of the Pullman Company. The total number of air-conditioned cars in service on the Missouri Pacific, upon the completion of these 93, will be 328.

Special attention is also being given to modernizing the seating equipment, washrooms and lighting of coaches. An innovation in the equipment of coaches will be lunch counters for colored patrons. New effects in lighting are also to be installed for the convenience of passengers at night and coach passengers are now ticketed through to avoid disturbance during the night hours.

FREIGHT CARS

THE LEHIGH VALLEY has authorized the construction in its own shops of 250 composite coal cars of 50 tons' capacity to be built of all new material; 250 composite and 500 all-steel 50-ton coal cars to be built of new and second-hand material. The 500 composite cars will be constructed

at Sayre, Pa., and the 500 steel cars at Packerton, Pa. The cost of constructing these cars is being partly financed through the aid of the Federal Emergency Administration of Public Works.

THE NORTHERN PACIFIC is inquiring for a number of convertible ballast cars of 50 tons' capacity. This is in addition to inquiries for cars reported in the *Railway Age* of February 22.

THE CALIFORNIA DISPATCH LINE has ordered five tank cars of 40 tons' capacity from the American Car & Foundry Company.

THE WESTERN PACIFIC has asked permission from the Interstate Commerce Commission to issue \$3,000,000 of trustees' certificates to be used in connection with its \$3,900,000 program to be spent for deferred and normal maintenance and new equipment, including new rail (order for 31,000 tons reported in the *Railway Age* of February 15), rebuilding 50 freight cars, rehabilitating 500 cars, air conditioning 4 passenger cars, replacing arch-bar trucks with modern trucks on 1,000 cars and purchase of 100 steel hopper cars; order for the 100 cars was reported in the *Railway Age* of February 8.

IRON AND STEEL

THE MISSOURI PACIFIC has ordered 17,000 tons of rails and 1,000,000 tie plates.

THE ERIE has applied to the Interstate Commerce Commission for authority for the expenditure of \$1,098,199 for 18,090 tons of first quality rail, 1,175 tons of second quality rail and other track material, for which the company had applied to the Public Works Administration for an additional loan of \$1,100,000.

MOTOR VEHICLES

THE PACIFIC ELECTRIC has accepted from the Twin Coach Corporation delivery of six buses of 23-passenger capacity each.

MISCELLANEOUS

THE CHICAGO, BURLINGTON & QUINCY has placed an order with The Timken Roller Bearing Company, Canton, Ohio, for bearings and boxes to equip all driving axles of three new class 4-8-4 steam locomotives, which it is now building in its own shops. The Burlington has also equipped all driving axles of seven of its existing locomotives with Timken bearings.

THE ILLINOIS CENTRAL high speed five-car streamlined Diesel train which is now being built by the Pullman-Standard Car Manufacturing Company, to be operated between Chicago and St. Louis, will be equipped with bearings furnished by the Timken Roller Bearing Company, Canton, Ohio.

THE BALDWIN LOCOMOTIVE WORKS, Philadelphia, Pa., has placed an order with The Timken Roller Bearing Company for bearings to be used on a 600 H.P. Diesel locomotive.

Supply Trade

The Carnegie-Illinois Steel Corporation is constructing a normalizing unit for its rail mill at Gary, Ind., at an approximate cost of \$500,000.

Joseph L. Noon, eastern railway sales manager of **The Glidden Company**, at Reading, Pa., effective March 1, becomes manager of railway sales with headquarters at Cleveland, Ohio.

C. E. Stryker, formerly chief engineer of the **Fansteel Metallurgical Corporation**, has become associated with **McKinsey, Wellington & Company** in its Chicago office. This company provides management engineering service, etc.

R. J. Eckstein has been appointed manager of the Cleveland, Ohio, office of **Cutler-Hammer, Inc.**, Milwaukee, Wis. Mr. Eckstein became associated with this company 25 years ago and worked through practically every department before going to the Cleveland office.

The Heywood-Wakefield Company, Gardner, Mass., has leased the entire east end of the first floor at 1 Park avenue, New York City, which was temporarily occupied by the company. At this address the company will maintain displays of its regular furniture lines, also of railway and bus seats, etc. The offices of its Railway Sales division and New York sales offices will be located at this address about April 1.

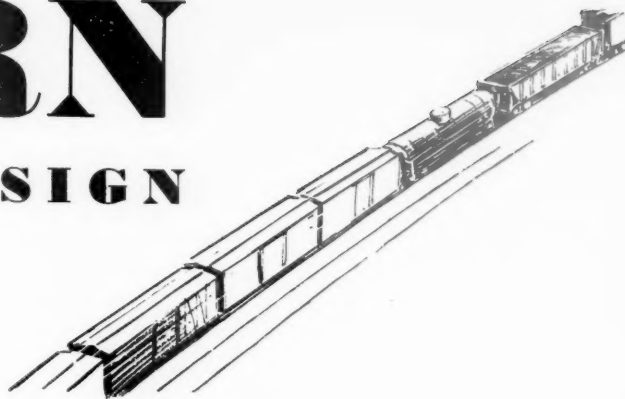
E. E. Griest, vice-president in charge of manufacture of the **Franklin Steel Works**, Franklin, Pa., has been elected vice-president and general manager of the **Fort Pitt Malleable Iron Company**, Pittsburgh, Pa. He was born in Zanesville, Ohio, and graduated from **Purdue University** in 1907. He served as a machinist apprentice, machinist and foreman in the Pennsylvania shops at Columbus, Ohio, from 1900 to 1904, and for a short time following graduation in 1907 was employed in the engineering department of the **Crucible Steel Company of America**. From 1907 to 1908, he was a machine shop foreman on the Erie and from 1908 to 1918 was assistant general foreman, assistant master mechanic and master mechanic, respectively, for the Pennsylvania at Ft. Wayne, Ind. In the latter year he became assistant general superintendent of the **Chicago Railway Equipment Company** and in 1919 was appointed general superintendent. From June 15, 1931, to February 15, 1936, he was vice-president in charge of manufacture of the **Chicago Railway Equipment Company**, the **Grand Rapids Malleable Works**, the **Marion Malleable Iron Works** and the **Franklin Steel Works**.

American Steel Foundries

The annual report of the **American Steel Foundries** for 1935 shows a net profit of \$116,692, as compared with \$245,365 for the previous year. The balance sheet shows a ratio of quick assets to liabilities of 10.4 to 1. The net working capital is

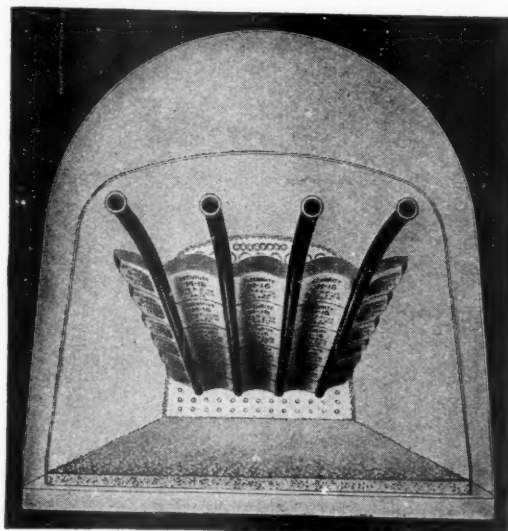
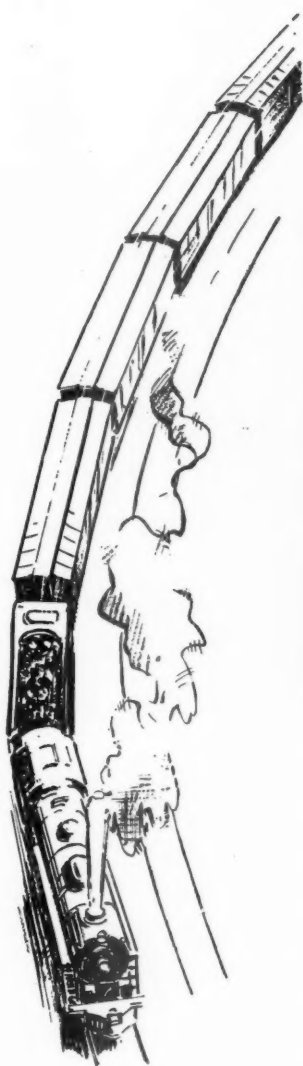
MODERN

LOCOMOTIVE DESIGN



Increases
EARNING CAPACITY

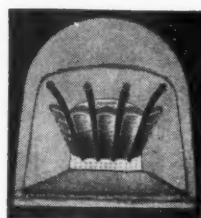
Lowers
OPERATING COSTS



The Security Arch is designed to aid this progress. » » » Where power has been modernized be sure that a Security Brick Arch suited to its needs is applied. » » » Our engineers will gladly cooperate with you.

*There's More To
SECURITY ARCHES
Than Just Brick*

**HARBISON-WALKER
REFRACTORIES CO.**
Refractory Specialists



**AMERICAN ARCH CO.
INCORPORATED**
*Locomotive Combustion
Specialists* » » »

\$10,627,392. There was added to the property account during the year \$661,955, principally for the rebuilding of a chilled iron wheel foundry at Chicago and the installation of new boilers and the construction of a new open hearth furnace and building at the Granite City Works. The consolidated income account for the year ending December 31, 1935, with comparisons with 1934, follows:

	1935	1934
Profit from operations, after deducting manufacturing, selling and administrative expenses, but before provision for depreciation.....	\$906,181	\$1,168,867
Deduct depreciation	703,583	930,853
Profit from operations.....	\$202,598	\$238,014
Add—Miscellaneous income:		
Interest, discount and exchange	\$16,744	\$27,009
Income from investments	34,988	61,852
Less — Miscellaneous net charges to income.....	44,945	.....
Total profit and income....	\$209,385	\$326,875
Deduct:		
Provision for federal income taxes	\$87,223	\$74,906
Net earnings of subsidiary company appertaining to outstanding minority stockholdings.	\$5,470	\$6,604
Net income carried to earned surplus	\$116,692	\$245,365

OBITUARY

Joseph F. Karcher, vice-president and secretary of the Morden Frog & Crossing Works, Chicago, died in that city on February 21. He was born in Louisville, Ky., on March 13, 1876, and started his career as a court reporter. He entered the employ of the Morden Frog & Crossing Works in September, 1896, as a stenographer and office manager, and has been with this company since, with the exception of a few years from September, 1905, to August, 1911, when he was in Mexico on a mining venture. On his return from Mexico, he was appointed cashier and was advanced to secretary and assistant treasurer and later to vice-president and secretary, the position he was holding at the time of his death.

Construction

LEHIGH VALLEY.—Revised plans and an estimated cost of \$132,000 for the elimination of the Old Varick crossing of this road on the Willard-Geneva highway in Varick, N. Y., have been approved by the New York Public Service Commission. The railroad was authorized to do certain work of the elimination without contract at a cost limit of \$15,370.

NEW YORK CENTRAL.—The elimination of the Railroad avenue crossing of this road in Macedon, N. Y., has been directed by the New York Public Service Commission. The plan calls for depressing the grade of the highway and carrying it under the raised grade of the railroad at an estimated cost of \$136,700, exclusive of land and property damages. The commission has approved the bid of \$127,621 submitted by the Walsh Construction Company, Syracuse, N. Y., for the elimination of the North Main street (Willow

avenue) and Mud Hill road crossings of the New York Central in Newark, N. Y. The commission directed that the contract be awarded and work begun as soon as practicable.

PENNSYLVANIA.—A contract has been given to the Rust Engineering Company, Pittsburgh, Pa., for the construction of an underpass bridge at Napier Crossing, located about 2.3 miles north of Franklinville station in the town of Farmersville, N. Y., (See *Railway Age* of February 22, page 339). A contract has been given to John D. Walsh, Inc., New York, for the elimination of grade crossing on Clymer-Panama Federal Aid Highway No. 8208, about 2.25 miles south of Panama station, in the town of Clymer, N. Y.

SEABOARD AIR LINE.—Examiner C. P. Howard of the Interstate Commerce Commission has recommended in a proposed report that the commission deny the application of the receivers for a certificate authorizing the construction of a 10-mile branch line in Highland county, Fla., to serve agricultural lands southeast of Lake Istokpoga. The application was opposed by the Atlantic Coast Line. It was proposed to build the first 4 miles at once and delay the remaining 6 miles and the examiner recommends denial without prejudice to the filing of a new application.

Railroads Carry on Through Storm

Traffic difficulties caused by the storm which has held in its icy grip the vast territory between the Mississippi River and the Atlantic Seaboard and from the Canadian border to the Carolinas emphasize the fact that the railroads, except for minor dislocations, have uninterruptedly maintained their services.

Icy roads and streets have brought peril to motorists and only the more adventurous have driven during the last two days. Buses have skidded and slithered, sometimes over embankments, endangering the lives of occupants. The railroads have gone steadily along transporting greatly increased numbers of passengers, for the most part with a minimum of delay and inconvenience.

Such weather as that experienced in the East hampers air travel. Planes have been grounded, in many cases, until the atmospheric conditions which caused the ice storm abated. The railroads, however, have been able to meet extraordinary demands with amazing efficiency. More and larger trains have had to make more stops and carry more passengers than usual.

In crises, as at no other time, the railroads demonstrate their all-around supremacy in transportation service. They merit consideration, instead of abuse, at the hands of Government agencies.

—From the Philadelphia Inquirer.

Financial

AKRON, CANTON & YOUNGSTOWN.—*Annual Report.*—The 1935 annual report of this road and its subsidiary, the Northern Ohio, shows net income of \$122,041, as compared with net income of \$31,217 in 1934, an increase of \$90,823. Selected items from the Income Statement follow:

	1935	1934	Increase or Decrease
Average Mileage Operated	171.31	171.31	.....
RAILWAY OPERATING REVENUES	\$1,986,860	\$1,721,879	+\$264,981
Maintenance of way	330,418	250,805	+79,612
Maintenance of equipment	205,250	168,189	+37,060
Transportation	611,001	526,267	+84,733
TOTAL OPERATING EXPENSES	1,335,299	1,143,091	+192,208
Operating ratio	67.19	66.34	+85
NET REVENUE FROM OPERATIONS	651,913	579,556	+72,356
Railway tax accruals	91,239	123,079	-31,840
Hire of freight cars	178,400	170,799	+7,601
Joint facility rents	.30	.30	.....
NET RAILWAY OPERATING INCOME	\$383,048	\$286,761	+\$96,286
Interest on funded debt	331,131	332,214	-1,083
TOTAL DEDUCTIONS FROM GROSS INCOME	356,482	358,478	-1,996
NET INCOME	\$122,041	\$31,217	+\$90,823

CHICAGO & NORTH WESTERN.—*Abandonment.*—The trustees have applied to the Interstate Commerce Commission for authority to abandon a branch line of 8.45 miles in Winnebago county, Ill.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—*Equipment Trust.*—The trustees have applied to the Reconstruction Finance Corporation to purchase \$3,840,000 of 4 per cent equipment trust certificates representing 80 per cent of the cost of \$4,800,000 of new equipment, in accordance with a letter dated January 15 in which the R.F.C. agreed to lend the amount if and when authorized by the commission and the court. The equipment to be acquired and the estimated cost of each item is as follows: 20 coaches, \$580,000; 2 express and taproom cars, \$58,000; 3 parlor cars, \$93,000; 2 dining cars, \$74,000; 5 mail-express cars, \$95,000; 5 baggage cars, \$80,000; 1 steam locomotive, Hiawatha type, \$115,000; 500 50-ton hopper cars, 500 50-ton automobile cars, and 500 40-ton automobile cars.

CHICAGO, SOUTH SHORE & SOUTH BEND.—*Reorganization Plan.*—The Interstate Commerce Commission has made public a second report proposed by the Bureau of Finance dealing with a plan of reorganization of this company, in order to afford interested parties an opportunity to advise the commission in writing of their further suggestions. The commission, by Division 3, has also issued a report finding that this company is not a street, interurban, or suburban electric railway within the exemption proviso of the railway labor

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THE SUPERHEATER COMPANY

NEW YORK



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ELESCO SUPERHEATER UNIT BOLTS

represent 25 years of progressive development



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MONTREAL
The Superheater Co., Ltd.
Dominion Square Bldg.

CHICAGO
Peoples Gas Bldg.

REPRESENTATIVE OF AMERICAN THROTTLE COMPANY, INC.

act and that it is therefore subject to the provisions of that act.

DELAWARE, LACKAWANNA & WESTERN.—Equipment Trust Certificates.—The Interstate Commerce Commission has authorized the modification of a supplemental order whereby it authorized this company to issue \$1,043,000 of series B equipment trust certificates to the Public Works Administration, to provide for a reduction in the amount to \$1,033,000 and to cancel the right of redemption.

FORT WORTH & DENVER CITY.—R. F. C. Loan.—Division 4 of the Interstate Commerce Commission has approved the purchase by the Reconstruction Finance Corporation of \$8,176,000 of this company's first mortgage 4½ per cent bonds proposed to be issued under a new indenture and delivered to the Chicago, Burlington & Quincy, which is to sell them to the R. F. C. under an arrangement for a refund of interest during the first year in excess of 4 per cent. The proceeds are to be used to retire a like amount of 5½ per cent bonds.

LEHIGH & NEW ENGLAND.—Annual Report.—The 1935 annual report of this company shows net income, after interest and other charges, of \$433,709, as compared with net income of \$362,577 in 1934. Selected items from the Income Statement follow:

	1935	1934	Increase or Decrease
RAILWAY OPERATING REVENUES	\$3,432,725	\$3,455,843	-\$23,118
Maintenance of way	396,341	435,568	-39,326
Maintenance of equipment	711,789	769,814	-58,025
Transportation	1,256,646	1,200,106	+56,539
TOTAL OPERATING EXPENSES	2,593,599	2,666,757	-73,157
Operating ratio	75.56	77.17	-1.61
NET REVENUE FROM OPERATIONS	839,125	789,086	+50,039
Railway tax accruals	83,391	82,065	+1,325
Railway operating income	755,541	706,923	+48,617
Hire of freight cars—Cr.	176,593	164,981	+11,612
NET RAILWAY OPERATING INCOME	822,797	761,745	+61,051
Non-operating income	27,199	28,138	-939
GROSS INCOME	849,996	789,884	+60,111
Interest on funded debt	388,804	398,234	-9,429
NET INCOME	\$433,709	\$362,577	-\$71,131
Disposition of net income:			
Income applied to sinking and other reserve funds	43,370	.....	43,370
Income Balance Transferred to Profit and Loss	\$390,338	\$362,577	+\$27,760

LEHIGH VALLEY.—P.W.A. Loan.—The Interstate Commerce Commission has authorized a further loan of \$1,755,000 from the Public Works Administration to this company to cover the cost of the new material to be used in constructing 500 composite cars and 500 all-steel cars in its own shops.

MINNEAPOLIS & ST. LOUIS.—Foreclosure Sale.—Sale of the Minneapolis & St. Louis by the United States district court at Minneapolis, Minn., scheduled for February

18, was postponed until April 17, no bids for the property being made.

MIDLAND VALLEY.—Abandonment.—The Interstate Commerce Commission has authorized this company to abandon a branch line extending from a point near Jenks, Okla., to Kiefer, 8.6 miles.

MINNEAPOLIS & ST. LOUIS.—Acquisition.—The Interstate Commerce Commission has assigned the application of the Associated Railways Company for authority to acquire the lines of this company for hearing before Assistant Director C. E. Boles of its Bureau of Finance at Minneapolis, Minn., on April 6; Fort Dodge, Ia., on April 20, and Aberdeen, S. D., on April 24.

PENNSYLVANIA.—Trackage Rights.—The Interstate Commerce Commission has authorized this company to operate under trackage rights over the Wheeling & Lake Erie from a point near Warrenton, Ohio, to a coal mine near Dun Glen, 9.6 miles.

PENNSYLVANIA.—Acquisition.—The Pennsylvania Transfer Company of Pittsburgh, part of a group of companies controlled by the Pennsylvania Railroad, has applied to the Interstate Commerce Commission for authority under the motor carrier act to acquire control, through complete stock ownership, of the Alko Express Lines for \$162,500 and the Barker Motor Freight Lines for \$25,000.

VIRGINIAN.—Bonds.—This company has applied to the Interstate Commerce Commission for authority for an issue of \$60,344,000 of first lien and refunding 3¾ per cent bonds and to issue nominally \$9,656,000 of the bonds, of which \$9,044,000 are to be exchanged for a like amount of first mortgage bonds held in the treasury. Authority was also asked for the issuance of

an unsecured note for \$5,000,000 for not to exceed 5 years at 2.81 per cent.

WABASH.—Reorganization Plan Denied.—New York newspapers of February 25 stated that a definite plan for reorganizing this property was nearing completion. On the following day A. K. Atkinson, vice-president of the company, stated that "since August last various interests in the company have exchanged views as to the possible terms of a reorganization and a number of studies have been prepared, but the matter has not yet reached a stage of definite negotiations."

WESTERN PACIFIC.—Trustees' Certificates.—The trustees have applied to the Interstate Commerce Commission for authority to issue \$3,000,000 of 4 per cent trustees' certificates to be used in connection with a program of \$3,900,000 of expenditures for deferred and normal maintenance and new equipment, including 183 miles of new rail, rebuilding of 50 freight cars, rehabilitation of 500 cars, air-conditioning 4 passenger cars, replacing arch-bar trucks with modern trucks on 1,000 cars, and acquisition of 100 steel hopper cars.

Average Prices of Stocks and of Bonds

	Feb. 25 week	Last year
Average price of 20 representative railway stocks..	49.55	49.96
Average price of 20 representative railway bonds..	81.57	81.40
		73.12

Dividends Declared

Boston & Albany.—\$2.00, payable March 31 to holders of record February 29.
Chestnut Hill.—75c, quarterly, payable March 4 to holders of record February 20.
Delaware & Bound Brook.—\$2.00, quarterly, payable February 20 to holders of record February 18.
Philadelphia & Trenton.—\$2.50, quarterly, payable April 10 to holders of record March 31.
Warren Railroad.—\$1.75, semi-annually, payable April 15 to holders of record April 4.

* * * *



Courtesy: Baltimore & Ohio Magazine.

No Business Moving Here

With the above caption the Baltimore & Ohio Magazine for February published the accompanying view of the ice-clogged Ohio river, calling attention to the fact that shipping on it has been suspended since January 22.

"Meantime," it adds "the railroads, which serve the same territory, are moving the freight which has to move, through sub-zero weather, and with remarkable dependability and speed. During 1934, 18,636,366 tons of freight were shipped on this waterway. Little of it would have been shipped had it not been for the fact that the taxpayers have put up millions of dollars to dredge and dam the river, keep the channel open, etc., and shippers thus been subsidized at the expense of the people as a whole. Yet, with all this, it is now out of commission and the railroads carry the burden."

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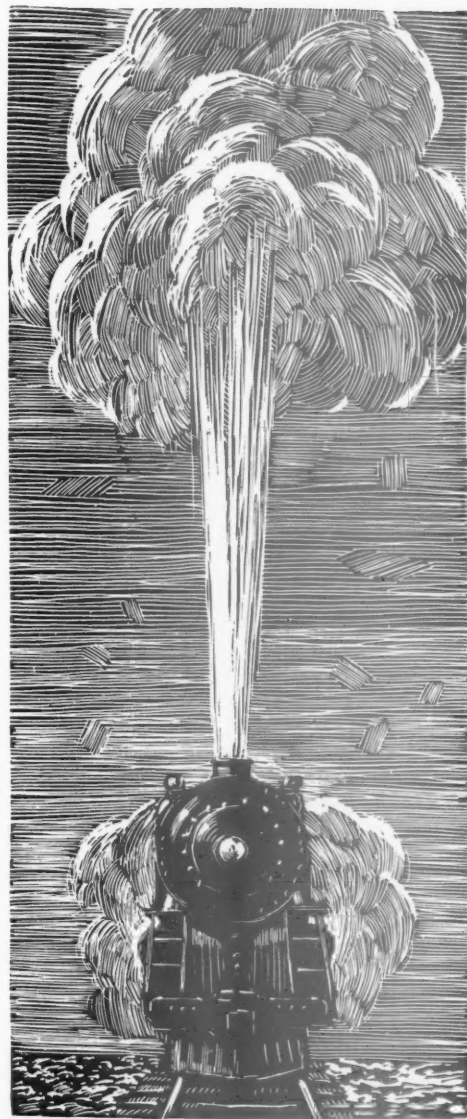
SAFETY

"In excess of 450,000,000 passengers were carried by Class 1 roads in 1935, nearly four times the population of the country. The records available covering twelve months of 1935 show that not one paying passenger was killed last year on Class 1 roads in the United States.

Despite public utterance by the long beards who point out to ignorant masses the inherent dangers of high centers of gravity, yet I tell you that it was *Steam* and the *Steam Locomotive* that carried safely the preponderance of this army of millions of travellers."

From "STEAM AND THE RAILROADS"

By W. C. DICKERMAN



AMERICAN LOCOMOTIVE COMPANY

A LCO

30 CHURCH STREET NEW YORK N.Y.

Railway Officers

OPERATING

H. H. Hersh, division engineer of the Akron division of the Baltimore & Ohio, with headquarters at Akron, Ohio, has been promoted to assistant superintendent of the Chicago division, with headquarters at Garrett, Ind.

W. J. Nodier, assistant trainmaster of the Williamsport division of the Pennsylvania, has been transferred in the same capacity to the Delmarva division. **A. L. Hunt**, assistant trainmaster of the Delmarva division, has been transferred in the same capacity to the Williamsport division.

M. M. Sisson, superintendent of the Eastern division of the St. Louis-San Francisco, with headquarters at Springfield, Mo., has been promoted to assistant general manager, with the same headquarters. **H. R. Wade**, assistant superintendent at Amory, Miss., has been promoted to superintendent of the Central division, with headquarters at Ft. Smith, Ark., succeeding **O. L. Young**, who has been transferred to the River division at Chaffee, Mo. Mr. Young replaces **J. S. McMillan**, who has been transferred to the Eastern division at Springfield, to succeed Mr. Sisson.

TRAFFIC

George C. Martin, general freight and passenger agent of the Toronto, Hamilton & Buffalo, with headquarters at Hamilton, Ont., will retire under the pension rules of the company on March 1, after 38 years of service. **Rowland F. Hill** has been appointed general freight and passenger agent, effective March 1.

C. P. Schwarz, city freight agent for the Chicago, Milwaukee, St. Paul & Pacific at Chicago, has been appointed special coal agent, with headquarters at the

same point, succeeding **Charles Kehm**, deceased.

L. N. DeWeese, industrial agent for the Pere Marquette, has been appointed assistant industrial commissioner, with headquarters as before at Detroit, Mich., and **J. W. Smythe** has been appointed industrial agent at Detroit.

John D. Cameron, division traffic agent for the Illinois Central at Bloomington, Ill., has been appointed general agent of mail and express traffic, with headquarters at Chicago, succeeding **Wayne A. Johnston**, who has been appointed office manager in the traffic department at Chicago.

Horace B. Northcott, advertising agent of the Union Pacific, with headquarters at Omaha, Neb., has been appointed assistant general passenger agent, with the same headquarters. **C. P. Moore**, chief of the correspondence bureau of the general passenger department, has been appointed advertising agent, succeeding Mr. Northcott.

Paul Echols, division freight agent on the Illinois Central at Omaha, Neb., has been appointed manager of a newly-organized research bureau in the traffic department of this company, which will serve as a clearing house for suggestions looking toward improvements in sales and service on the railroad and additionally will conduct original investigations in these and related fields. Mr. Echols' headquarters will be at Chicago.

PURCHASES AND STORES

G. A. Goerner, purchasing agent of the Colorado & Southern (a unit of the Burlington System), has been appointed general storekeeper of the Chicago, Burlington & Quincy, with headquarters at Chicago, effective February 17, succeeding **R. D. Long**, whose appointment as purchasing agent was noted in the *Railway Age* for February 22. **Hal D. Foster**, traveling storekeeper of the Burlington, with headquarters at Chicago, has been appointed purchasing agent of the Colorado

& Southern, with headquarters at Denver, Col., to succeed Mr. Goerner. A photograph and a brief biographical sketch of Mr. Goerner were presented in the February 8 issue of the *Railway Age* in connection with his appointment as purchasing agent of the C. & S., previous to which appointment he was traveling storekeeper of the Burlington, with headquarters at Chicago.

OBITUARY

Charles Kehm, special coal agent of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Chicago, died on February 2.

John W. Wilds, for several years secretary to Frederick E. Williamson, president of the New York Central, died suddenly on February 21 while attending the annual dinner of the Traffic Club of New York at the Hotel Commodore in that city. Mr. Wilds, who was 47 years old, had also been associated with Mr. Williamson on the Chicago, Burlington & Quincy.

John J. Baxter, assistant chief engineer of the Wabash, with headquarters at St. Louis, Mo., died on February 20 of pneumonia and heart disease at St. John's hospital in St. Louis, following an illness of three weeks. Mr. Baxter was born on July 10, 1882, at Moberly, Mo., and received his higher education at the University of Missouri. He entered railway service in 1902 as a rodman on the Wabash and later served with the Chicago, Burlington & Quincy, the Mexican National and the Kansas City Terminal as instrumentman and assistant engineer. On the Burlington he served also as office engineer and chief computer in the construction and valuation department. Mr. Baxter returned to the Wabash on May 1, 1918, as assistant engineer at St. Louis, being promoted to division engineer, with headquarters at Peru, Ind., a month later. On October 1, 1923, he was further advanced to assistant chief engineer, which position he was holding at the time of his death.

Net Income for December and Twelve Months of Calendar Year 1935

	Net Income			Net Income	
	1935	1934		1935	1934
Akron, Canton & Youngstown.....Dec.	31,701	15,611	Cambria & Indiana.....Dec.	110,309	51,667
12 mos. 244,023	116,438	12 mos. 749,166	583,402		
Alton .....Dec.	54,823	144,433	Canadian Pacific Lines in Maine.....Dec.	—	62,237
12 mos. 2,142,168	1,644,579	12 mos. —	62,237		
Atchison, Topeka & Santa Fe System.....Dec.	3,093,949	911,774	Canadian Pacific Lines in Vermont.....Dec.	—	—
12 mos. 9,554,315	7,001,314	12 mos. —	—		
Atlanta & West Point.....Dec.	1,672	24,657	Central of Georgia.....Dec.	179,775	241,178
12 mos. 26,729	133,548	12 mos. 2,248,198	2,607,342		
Western of Alabama.....Dec.	2,937	22,621	Central New Jersey.....Dec.	212,572	160,805
12 mos. 77,302	82,614	12 mos. 2,346,738	1,536,070		
Atlanta, Birmingham & Coast.....Dec.	13,862	43,110	Central Vermont .....Dec.	21,706	100,626
12 mos. 89,037	317,564	12 mos. 789,656	1,068,192		
Atlantic Coast Line.....Dec.	561,481	386,347	Chesapeake & Ohio.....Dec.	2,662,491	2,134,477
12 mos. 2,529,455	495,478	12 mos. 31,039,485	28,062,403		
Charleston & Western Carolina.....Dec.	7,817	5,066	Chicago & Eastern Illinois.....Dec.	28,663	114,068
12 mos. 47,726	102,738	12 mos. 1,470,247	1,494,201		
Baltimore & Ohio.....Dec.	149,980	330,513	Chicago & Illinois Midland.....Dec.	33,056	25,491
12 mos. 3,180,909	3,825,752	12 mos. 209,607	143,276		
Staten Island Rapid Transit.....Dec.	—	—	Chicago & North Western.....Dec.	407,130	598,975
12 mos. —	—	12 mos. 11,070,348	8,276,194		
Bangor & Aroostook.....Dec.	58,124	47,746	Chicago, Burlington & Quincy.....Dec.	462,470	361,848
12 mos. 873,753	947,394	12 mos. 1,842,843	4,454,759		
Bessemer & Lake Erie.....Dec.	73,367	243,607	Chicago Great Western.....Dec.	323,016	128,862
12 mos. 2,003,496	390,410	12 mos. 518,252	612,405		
Boston & Maine.....Dec.	554,828	698,949	Chicago, Indianapolis & Louisville.....Dec.	25,500	360,848
12 mos. 206,765	293,493	12 mos. 1,314,465	1,416,314		
Brooklyn Eastern District Terminal.....Dec.	—	—	Chicago, Milwaukee, St. Paul & Pac.....Dec.	829,579	1,662,838
12 mos. —	—	12 mos. 18,008,748	16,247,621		
Burlington, Rock Island.....Dec.	73,428	84,892	Chicago, Rock Island & Pacific.....Dec.	1,384,792	1,254,267
12 mos. 1,056,550	1,027,449	12 mos. 15,023,571	11,943,697		

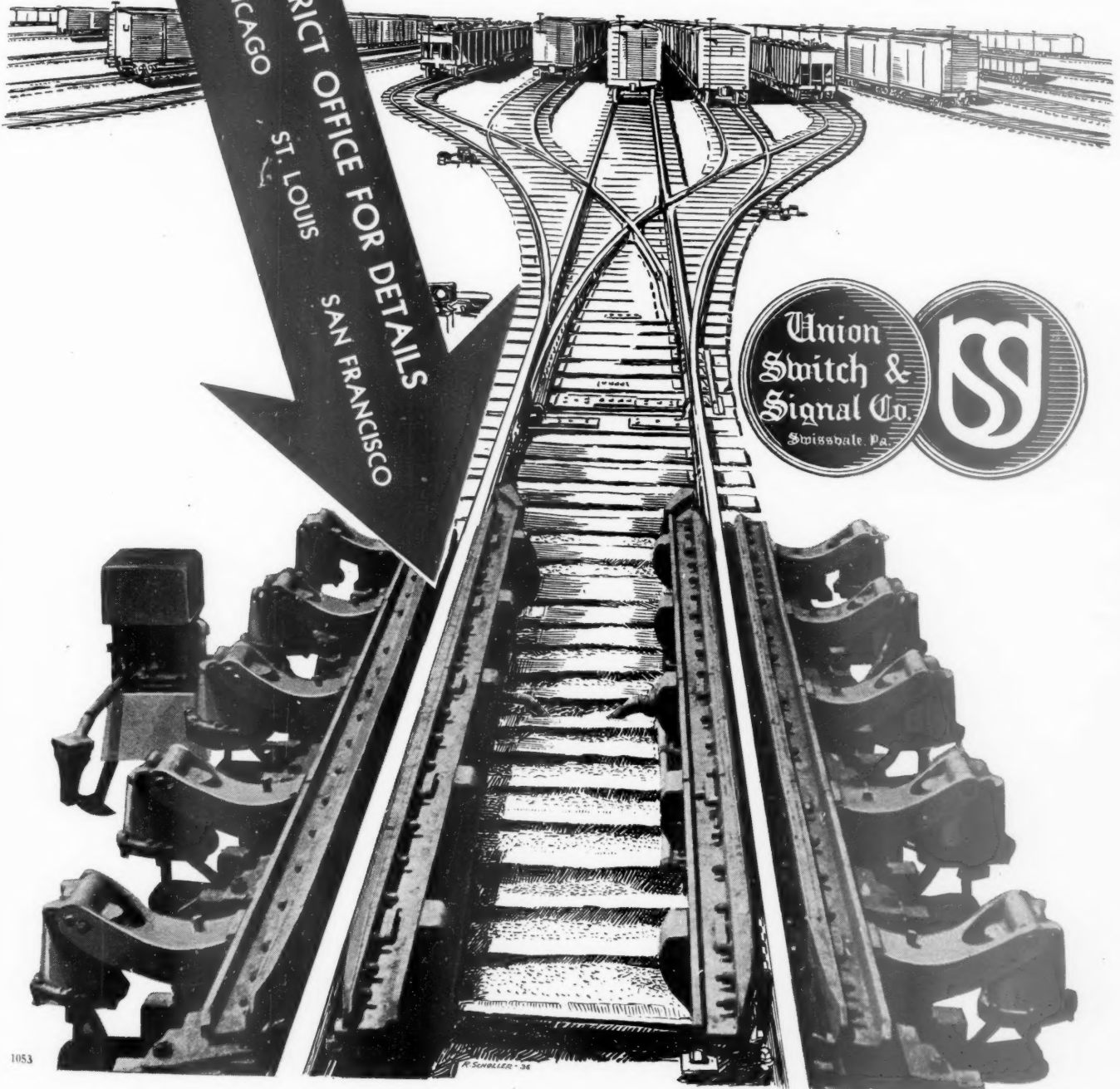
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1053

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Net Income for December and Twelve Months of Calendar Year 1935 (Continued)

		Net Income				Net Income	
		1935	1934			1935	1934
Chicago, Rock Island & Gulf.....	Dec.	204,290	253,319	Monongahela	Dec.	47,800	27,139
.....	12 mos.	1,211,564	1,367,704	.....	12 mos.	399,688	248,398
Chicago, St. Paul, Minn. & Omaha.....	Dec.	172,228	280,625	Montour	Dec.	23,552	50,498
.....	12 mos.	2,302,708	1,923,210	.....	12 mos.	811,459	759,130
Clinchfield R. R.....	Dec.	557,220	474,789	Nashville, Chattanooga & St. Louis.....	Dec.	62,552	79,363
.....	12 mos.	.....	.....	.....	12 mos.	791,460	351,939
Colorado & Southern.....	Dec.	80,883	33,883	Nevada Northern	Dec.	8,620	1,576
.....	12 mos.	1,213,972	854,138	.....	12 mos.	103,103	61,434
Ft. Worth & Denver City.....	Dec.	231,758	26,770	New York Central	Dec.	4,168,728	848,335
.....	12 mos.	38,412	53,798	.....	12 mos.	115,046	7,682,335
Columbus & Greenville.....	Dec.	16,813	11,414	Pittsburgh & Lake Erie.....	Dec.	323,185	439,297
.....	12 mos.	63,032	7,372	.....	12 mos.	3,245,373	2,921,162
Delaware & Hudson.....	Dec.	260,034	474,353	New York, Chicago & St. Louis.....	Dec.	327,604	38,421
.....	12 mos.	2,774,977	2,601,063	.....	12 mos.	1,115,929	58,634
Delaware, Lackawanna & Western.....	Dec.	13,613	320,769	New York, New Haven & Hartford.....	Dec.	297,071	504,529
.....	12 mos.	2,932,305	1,972,612	.....	12 mos.	3,560,469	5,532,114
Denver & Rio Grande Western.....	Dec.	90,602	189,970	New York Connecting.....	Dec.	8,752	26,477
.....	12 mos.	3,268,798	2,975,872	.....	12 mos.	21,320	4,996
Denver & Salt Lake.....	Dec.	601,671	279,830	New York, Ontario & Western.....	Dec.	188,781	100,687
.....	12 mos.	89,827	12,493	.....	12 mos.	3,586	78,420
Detroit & Mackinac.....	Dec.	16,983	31,664	Norfolk & Western.....	Dec.	2,588,134	1,858,626
.....	12 mos.	53,160	14,345	.....	12 mos.	25,546,450	20,464,493
Detroit & Toledo Shore Line.....	Dec.	129,038	58,644	Norfolk Southern	Dec.	51,631	48,619
.....	12 mos.	930,665	623,564	.....	12 mos.	421,810	335,935
Detroit, Toledo & Ironton.....	Dec.	275,548	117,896	Northern Pacific	Dec.	5,698,226	3,713,811
.....	12 mos.	2,501,481	1,137,789	.....	12 mos.	431,781	899,407
Duluth, Missabe & Northern.....	Dec.	773,832	227,014	Northwestern Pacific	Dec.	122,980	137,002
.....	12 mos.	2,600,907	1,346,452	.....	12 mos.	1,475,000	1,440,124
Duluth, Winnipeg & Pacific.....	Dec.	576,361	841,417	Oklahoma City-Ada-Atoka	Dec.	20,272	7,645
.....	12 mos.	83	327,147	.....	12 mos.	62,304	88,650
Elgin, Joliet & Eastern.....	Dec.	138,580	463,112	Pennsylvania Railroad	Dec.	2,327,828	1,833,290
.....	12 mos.	1,119,480	389,059	.....	12 mos.	23,849,798	21,633,964
Erie	Dec.	69,759	307,750	Long Island	Dec.	84,340	293,488
.....	12 mos.	852,400	601,034	.....	12 mos.	1,407,841	478,690
New Jersey & New York.....	Dec.	39,443	46,442	Pennsylvania-Reading Seashore Lines.....	Dec.	225,556	226,570
.....	12 mos.	468,938	485,899	.....	12 mos.	2,623,045	2,762,302
N. Y., Susquehanna & Western.....	Dec.	11,999	18,486	Pere Marquette	Dec.	377,744	136,270
.....	12 mos.	379,342	385,038	.....	12 mos.	1,633,298	612,127
Florida East Coast.....	Dec.	207,244	183,480	Pittsburg & Shawmut.....	Dec.	1,766	12,560
.....	12 mos.	3,222,759	2,806,591	.....	12 mos.	51,638	7,182
Fort Smith & Western.....	Dec.	11,303	25,896	Pittsburgh & West Virginia.....	Dec.	31,121	24,503
.....	12 mos.	328,403	322,450	.....	12 mos.	95,496	92,271
Georgia Railroad	Dec.	56,282	14,307	Pittsburg, Shawmut & Northern.....	Dec.	12,921	2,044
.....	12 mos.	152,830	97,561	.....	12 mos.	132,194	170,371
Georgia & Florida.....	Dec.	54,690	65,026	Reading	Dec.	1,108,573	483,563
.....	12 mos.	619,464	676,530	.....	12 mos.	5,714,173	5,682,054
Grand Trunk Western.....	Dec.	53,820	56,286	Richmond, Fredericksburg & Potomac.....	Dec.	88,264	150,660
.....	12 mos.	291,821	1,639,964	.....	12 mos.	244,806	324,271
Canadian Nat'l Lines in New Eng.....	Dec.	1,313,204	1,368,713	Rutland	Dec.	44,637	22,459
.....	12 mos.	30,710	96,880	.....	12 mos.	482,982	375,102
Great Northern	Dec.	1,622,238	1,384,221	St. Louis-San Francisco.....	Dec.	729,803	1,086,239
.....	12 mos.	7,139,860	1,074,480	.....	12 mos.	10,485,734	9,583,990
Green Bay & Western.....	Dec.	13,763	24,214	Ft. Worth & Rio Grande.....	Dec.	23,511	26,036
.....	12 mos.	156,164	27,267	.....	12 mos.	257,849	265,877
Gulf & Ship Island.....	Dec.	16,549	254	St. Louis, San Francisco & Texas.....	Dec.	84,066	69,083
.....	12 mos.	160,954	220,530	.....	12 mos.	629,490	656,580
Gulf Mobile & Northern.....	Dec.	22,716	532	St. Louis Southwestern Lines.....	Dec.	85,917	268,276
.....	12 mos.	404,710	170,740	.....	12 mos.	455,195	1,145,437
Illinois Central	Dec.	4,739,599	445,327	San Diego & Arizona Eastern.....	Dec.	25,139	24,089
.....	12 mos.	8,603,762	1,005,608	.....	12 mos.	154,100	96,793
Yazoo & Mississippi Valley.....	Dec.	481,774	106,892	Seaboard Air Line.....	Dec.	579,421	543,900
.....	12 mos.	1,328,638	2,004,243	.....	12 mos.	7,609,365	8,029,553
Illinois Central System.....	Dec.	.....	.....	Southern Ry.	Dec.	788,207	1,248,774
.....	12 mos.	.....	.....	.....	12 mos.	1,523,193	2,773,136
Illinois Terminal	Dec.	8,381	53,963	Alabama Great Southern.....	Dec.	245,187	263,481
.....	12 mos.	241,298	395,907	.....	12 mos.	303,436	547,695
Kansas City Southern.....	Dec.	14,791	89,625	Cinn., New Orleans & Texas Pacific.....	Dec.	116,860	203,452
.....	12 mos.	955,731	1,009,127	.....	12 mos.	1,976,622	1,633,279
Kansas, Oklahoma & Gulf.....	Dec.	58,122	52,698	Georgia Southern & Florida.....	Dec.	42,598	37,523
.....	12 mos.	386,907	368,188	.....	12 mos.	203,316	200,722
Lake Superior & Ishpeming.....	Dec.	41,384	40,543	New Orleans & Northeastern.....	Dec.	10,442	312
.....	12 mos.	868,299	311,775	.....	12 mos.	178,474	287,707
Lehigh & Hudson River.....	Dec.	10,421	22,388	Northern Alabama	Dec.	5,246	15,495
.....	12 mos.	223,814	184,337	.....	12 mos.	88,150	66,973
Lehigh & New England.....	Dec.	17,885	48,192	Southern Pac. Transportation System.....	Dec.	962,662	1,335,394
.....	12 mos.	433,709	362,578	.....	12 mos.	2,346,590	408,225
Lehigh Valley	Dec.	205,121	154,359	Spokane, Portland & Seattle.....	Dec.	7,877	84,272
.....	12 mos.	1,843,801	1,891,141	.....	12 mos.	1,488,179	1,985,247
Louisiana & Arkansas.....	Dec.	32,721	19,830	Tennessee Central	Dec.	1,731	2,043
.....	12 mos.	428,984	291,802	.....	12 mos.	115,292	38,263
Louisiana, Arkansas & Texas.....	Dec.	1,423	12,253	Texas & Pacific.....	Dec.	246,774	92,584
.....	12 mos.	667	30,114	.....	12 mos.	1,382,278	1,031,944
Louisville & Nashville.....	Dec.	593,544	122,681	Texas Mexican	Dec.	11,939	8,051
.....	12 mos.	4,128,943	2,967,385	.....	12 mos.	17,213	25,855
Maine Central	Dec.	37,644	72,902	Toledo, Peoria & Western.....	Dec.	10,790	32,168
.....	12 mos.	134,541	35,251	.....	12 mos.	141,520	100,447
Midland Valley	Dec.	17,786	42,220	Union Pacific	Dec.	67,086,701	3,411,463
.....	12 mos.	64,474	59,619	.....	12 mos.	81,188,148	19,751,359
Minneapolis & St. Louis.....	Dec.	188,866	274,500	Oregon Short Line.....	Dec.	121,396	273,922
.....	12 mos.	2,855,645	2,943,072	.....	12 mos.	2,214,727	1,316,450
Minn., St. Paul & S. S. Marie.....	Dec.	543,004	468,685	Ore., Washington R. R. & Nav. Co.....	Dec.	128,371	277,480
.....	12 mos.	5,224,347	5,078,543	.....	12 mos.	2,656,623	2,888,510
Duluth, South Shore & Atlantic.....	Dec.	96,331	136,182	Los Angeles & Salt Lake.....	Dec.	84,174	85,720
.....	12 mos.	559,821	827,144	.....	12 mos.	286,835	468,050
Spokane International	Dec.	27,811	30,936	St. Joseph & Grand Island.....	Dec.	56,641	36,073
.....	12 mos.	288,005	325,150	.....	12 mos.	596,475	452,634
Mississippi Central	Dec.	9,798	20,076	Utah	Dec.	32,158	27,214
.....	12 mos.	104,685	141,915	.....	12 mos.	18,097	248,534
Missouri-Arkansas	Dec.	22,881	.....	Virginian	Dec.	469,516	386,770
.....	12 mos.	29,200	.....	.....	12 mos.	4,113,624	3,574,440
Missouri-Illinois	Dec.	10,079	2,576	Wabash	Dec.	279,314	155,797
.....	12 mos.	85,258	71,481	.....	12 mos.	2,268,468	3,107,621
Missouri-Kansas-Texas Lines	Dec.	194,343	429,707	Ann Arbor	Dec.	12,749	9,596
.....	12 mos.	2,449,078	2,790,636	.....	12 mos.	54,002	52,288
Missouri Pacific	Dec.	1,096,404	1,593,600	Western Maryland	Dec.	185,004	124,745
.....	12 mos.	15,241,696	14,201,818	.....	12 mos.	1,002,657	995,255
Gulf Coast Lines.....	Dec.	.....	.....	Western Pacific	Dec.	144,587	163,427
.....	12 mos.	.....	.....	.....	12 mos.	1,792,725	1,599,467
International Great Northern.....	Dec.	258,119	1,195,907	Wheeling & Lake Erie.....	Dec.	386,789	298,740
.....	12 mos.	2,285,126	1,417,368	.....	12 mos.	2,162,113	1,197,549
Mobile & Ohio.....	Dec.	123,516	193,971	Wichita Falls & Southern.....	Dec.	5,191	7,222
.....	12 mos.	1,583,767	1,704,221	.....	12 mos.	52,344	90,089

Table of Operating Statistics of Railways
begins on next left-hand page



SERVICE

Which Pays Big Dividends

THE service built into HUNT-SPILLER *Air Furnace* GUN IRON is recognized by leading railroad men to be one of the most important factors contributing to the economy of locomotive operation.

Increasing weights, frictional wear, stresses and temperatures have greatly emphasized the value of this material which insures maximum efficiency, greater mileage and fewer failures.

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HUNT-SPILLER

GUN IRON

Air Furnace

Freight Operating Statistics of Large Steam Railways—Selected Items for the Month of December,

Region, road, and year	Average miles of road operated	Train-miles	Locomotive-miles		Car-miles		Ton-miles (thousands)		Average number of locomotives on line				
			Principal and helper	Light	Loaded (thousands)	Per cent loaded	Gross Excluding locomotives and tenders	Net Revenue and non-revenue	Service-able	Un-serv-iceable	Per cent unserv-iceable	Stored	
New England Region:													
Boston & Albany.....	1935	373	131,114	138,552	12,186	2,976	66.3	160,854	55,790	54	38	41.7	8
	1934	402	123,973	128,581	8,833	2,825	65.5	154,095	51,854	53	42	44.3	8
Boston & Maine.....	1935	1,972	258,032	288,711	27,176	8,803	68.5	484,834	182,098	93	179	65.7	5
	1934	2,016	256,525	285,044	27,770	8,241	68.8	450,065	170,532	98	189	65.7	3
N. Y., New Hav. & Hartf.....	1935	2,039	340,182	415,925	20,544	10,570	65.2	586,044	219,931	186	114	38.1	7
	1934	2,045	329,270	398,742	19,010	9,852	65.3	546,407	198,240	217	138	38.8	36
Great Lakes Region:													
Delaware & Hudson.....	1935	831	209,254	286,335	36,830	7,021	62.8	444,489	209,011	243	29	10.6	149
	1934	848	206,319	278,586	31,659	6,744	60.5	432,388	196,620	250	27	9.7	157
Del., Lack. & Western.....	1935	992	347,166	386,731	52,510	10,671	64.0	632,453	242,189	142	96	40.3	27
	1934	992	332,443	371,334	48,886	10,056	64.7	597,293	233,016	185	87	31.9	41
Erie (incl. Chi. & Erie)....	1935	2,298	653,646	688,551	39,048	26,151	64.3	1,597,776	619,217	256	219	46.2	53
	1934	2,305	607,760	643,223	41,371	24,205	63.5	1,491,249	569,580	322	167	34.1	103
Grand Trunk Western.....	1935	1,007	243,152	247,967	3,419	6,505	60.5	401,353	138,962	79	60	43.0	..
	1934	1,007	194,340	196,712	2,303	4,848	58.8	302,917	102,428	64	75	53.8	..
Lehigh Valley	1935	1,318	394,486	418,472	43,007	11,844	64.5	742,416	303,230	122	160	56.7	2
	1934	1,335	377,368	399,232	38,107	10,683	63.3	681,096	279,896	194	118	37.8	28
New York Central.....	1935	10,885	2,671,156	2,803,109	168,436	83,984	58.7	5,510,469	2,243,279	889	642	41.9	79
	1934	10,929	2,354,446	2,464,855	156,207	74,112	59.8	4,789,546	1,964,954	877	687	43.9	68
N. Y., Chi. & St. Louis....	1935	1,674	448,051	452,699	6,291	14,244	62.3	869,314	328,472	122	50	29.2	28
	1934	1,661	454,832	458,390	4,914	13,801	61.2	839,649	304,110	138	42	23.1	38
Pere Marquette	1935	2,081	375,208	389,483	5,318	9,247	58.2	607,553	222,964	112	41	26.9	..
	1934	2,101	314,068	329,423	2,848	7,266	59.2	476,879	184,355	115	43	27.1	10
Pittsburgh & Lake Erie....	1935	234	67,672	70,017	51	2,423	56.4	204,884	109,198	36	34	48.4	12
	1934	234	57,894	59,972	48	2,185	56.4	179,941	95,207	38	33	45.9	18
Wabash	1935	2,435	562,113	572,358	11,888	16,354	61.5	982,885	332,116	162	154	48.8	30
	1934	2,435	536,005	545,877	11,018	14,982	61.2	910,973	297,873	163	169	50.9	31
Central Eastern Region:													
Baltimore & Ohio.....	1935	6,320	1,330,906	1,642,337	175,809	36,602	60.2	2,557,943	1,140,948	683	632	48.1	69
	1934	6,321	1,229,094	1,476,603	150,780	33,505	59.0	2,328,177	1,018,453	774	541	41.1	208
Central of New Jersey.....	1935	681	143,415	164,104	32,062	4,602	59.2	324,885	155,844	60	95	61.2	5
	1934	688	139,510	156,586	30,928	4,546	57.4	327,579	156,341	70	94	57.4	14
Chicago & Eastern Illinois..	1935	931	177,560	177,963	2,833	4,126	62.5	277,413	124,151	52	59	53.3	4
	1934	939	172,769	173,814	2,832	3,638	60.5	254,652	113,222	50	59	54.3	6
Elgin, Joliet & Eastern.....	1935	434	93,694	95,052	1,548	2,155	58.8	172,182	85,293	53	34	38.9	..
	1934	446	80,907	81,906	777	1,694	57.6	136,959	66,619	62	26	29.9	13
Long Island	1935	393	27,907	29,274	15,068	247	49.7	19,970	7,899	36	14	28.1	4
	1934	393	30,696	31,666	14,163	290	53.8	22,079	9,169	37	24	39.3	1
Pennsylvania System	1935	10,009	2,708,193	3,096,606	345,385	89,544	61.2	6,137,549	2,735,405	1,315	1,119	46.0	139
	1934	9,994	2,368,265	2,648,484	303,317	79,723	60.8	5,400,734	2,381,520	1,405	1,031	42.3	296
Reading	1935	1,451	404,035	438,866	50,093	10,815	59.1	802,212	382,883	257	90	25.9	75
	1934	1,453	389,245	423,426	48,285	10,728	58.1	804,881	388,539	267	100	27.3	73
Pocahontas Region:													
Chesapeake & Ohio.....	1935	3,050	787,193	828,523	34,408	31,367	54.2	2,682,949	1,435,452	386	105	21.4	63
	1934	3,078	746,963	787,776	31,654	29,158	55.5	2,492,440	1,342,197	435	98	18.3	134
Norfolk & Western.....	1935	2,145	592,809	625,117	32,496	22,115	58.8	1,826,609	962,679	314	54	14.8	80
	1934	2,164	531,018	553,861	25,504	18,989	59.8	1,513,312	800,712	358	37	9.4	139
Southern Region:													
Atlantic Coast Line.....	1935	5,146	522,010	523,389	7,265	10,278	60.1	564,434	188,921	275	118	30.1	32
	1934	5,148	522,888	523,726	7,209	10,012	59.3	551,462	181,418	301	151	33.5	61
Central of Georgia.....	1935	1,886	222,231	223,066	3,581	4,509	67.1	253,395	97,331	99	30	23.3	..
	1934	1,886	207,085	207,784	3,140	4,129	66.7	232,815	86,136	105	37	25.8	..
Illinois Central (incl. Y. & M. V.).....	1935	6,570	1,461,235	1,469,476	29,475	32,689	59.8	2,203,344	912,278	623	233	27.2	20
	1934	6,579	1,387,592	1,394,184	26,771	30,245	58.8	2,081,214	867,143	598	331	35.6	8
Louisville & Nashville.....	1935	5,007	1,039,397	1,124,328	31,998	22,015	58.8	1,581,833	761,406	318	252	44.2	10
	1934	5,049	919,937	984,758	25,771	18,770	59.6	1,320,065	628,411	326	257	44.1	20
Seaboard Air Line.....	1935	4,295	446,658	454,372	4,137	10,552	65.0	617,157	229,475	181	88	32.7	3
	1934	4,295	447,114	456,336	2,909	10,239	61.9	605,258	209,838	184	87	32.1	9
Southern	1935	6,599	1,151,727	1,167,637	20,104	24,187	63.9	1,397,574	539,109	532	285	34.9	55
	1934	6,599	1,037,266	1,051,552	17,659	21,649	62.8	1,262,838	481,926	567	285	33.4	86
Northwestern Region:													
Chi. & North Western.....	1935	8,355	886,134	922,014	24,238	22,278	61.1	1,398,710	501,255	531	238	31.0	126
	1934	8,428	829,764	877,865	21,406	20,197	61.9	1,257,491	424,137	562	268	32.2	181
Chicago Great Western.....	1935	1,458	230,471	230,978	5,655	6,392	58.0	406,872	140,051	69	27	28.0	7
	1934	1,456	227,546	228,179	8,808	6,060	56.8	393,725	135,127	64	36	35.8	6
Chi., Milw., St. P. & Pac.....	1935	11,115	1,214,606	1,278,338	57,602	29,714	58.7	1,937,606	760,852	512	156	23.4	128
	1934	11,152	1,161,506	1,220,910	58,320	26,821	58.7	1,734,623	680,528	494	266	35.1	128
Chi., St. P., Minneap. & Om.....	1935	1,641	211,621	217,580	10,297	4,383	60.4	282,931	107,366	112	30	21.1	38
	1934	1,644	200,789	208,534	10,259	3,892	60.7	247,252	97,748	113	45	28.5	54
Great Northern	1935	8,244	655,016	662,552	22,778	19,585	65.1	1,210,000	509,055	435	170	28.1	76
	1934	8,302	652,256	657,806	22,011	18,657	64.9	1,135,220	453,381	428	175	29.0	85
Minneap., St. P. & S. St. M.....	1935	4,273	334,703	340,170	3,188	7,073	62.2	403,402	168,426	121	28	18.8	3
	1934	4,274	337,733	342,500	2,087	6,500	62.6	371,864	144,239	110	45	28.9	..
Northern Pacific	1935	6,422	584,501	635,399	42,529	17,149	68.8	1,003,372	435,319	344	106	23.5	19
	1934	6,408	532,235	580,627	39,114	15,124	67.3	882,566	365,865	345	102	22.7	23
Oreg.-Wash. R. R. & Nav.....	1935	2,099	170,237	178,186	10,967	4,187	66.6	253,790	101,755	93	35	27.6	17
	1934	2,125	158,418	164,616	9,496	3,476	68.9	203,965	80,810	92	36	28.5	27
Central Western Region:													
Alton	1935	928	194,267	198,554	2,357	3,894	59.9	257,989					

1935, Compared with December, 1934, for Roads with Annual Operating Revenues Above \$25,000,000

Region, road, and year	Average number of freight cars on line			Per cent un-service-able	Gross ton-miles per train-hour, excluding locomotives and tenders		Net ton-miles per train-mile	Net ton-miles per loaded car-mile	Net ton-miles per car-day	Car-miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders	Locomotive-miles per locomotive-day
	Home	Foreign	Total		Gross ton-miles per train-hour, excluding locomotives and tenders	Gross ton-miles per train-mile, excluding locomotives and tenders							
New England Region:													
Boston & Albany.....1935	2,487	4,576	7,063	21.2	20,877	1,227	426	18.7	255	20.5	4,822	175	53.0
1934	2,949	3,623	6,572	25.7	20,684	1,243	418	18.4	255	21.2	4,164	178	46.5
Boston & Maine.....1935	7,557	8,628	16,185	15.0	25,187	1,879	706	20.7	363	25.6	2,979	114	37.5
1934	10,076	6,376	16,452	22.3	24,140	1,754	665	20.7	334	23.5	2,729	119	35.2
N. Y., New Hav. & Hartf.....1935	13,788	11,716	25,504	16.3	25,295	1,723	647	20.8	278	20.5	3,480	115	46.9
1934	16,180	10,293	26,473	13.6	24,330	1,659	602	20.1	242	18.4	3,127	119	37.9
Great Lakes Region:													
Delaware & Hudson.....1935	10,201	2,916	13,117	3.6	28,968	2,124	999	29.8	514	27.5	8,114	118	38.4
1934	10,969	2,753	13,722	4.5	28,283	2,096	953	29.2	462	26.2	7,477	118	36.1
Del., Lack. & Western.....1935	15,341	5,181	20,522	15.3	30,796	1,822	698	22.7	381	26.2	7,877	151	59.4
1934	16,701	4,444	21,145	11.7	29,210	1,797	701	23.2	355	23.7	7,578	161	49.8
Erie (incl. Chi. & Erie).....1935	21,271	12,774	34,045	5.4	39,890	2,444	947	23.7	587	38.5	8,694	109	49.4
1934	25,960	12,203	38,163	7.1	39,941	2,454	937	23.5	481	32.2	7,971	110	45.2
Grand Trunk Western.....1935	4,481	7,802	12,283	15.7	30,355	1,651	572	21.4	365	28.2	4,453	104	58.2
1934	5,497	6,813	12,310	15.4	28,464	1,559	527	21.1	268	21.6	3,282	113	46.2
Lehigh Valley .....1935	12,209	7,949	20,158	7.1	35,992	1,882	769	25.6	485	29.4	7,421	141	52.7
1934	17,723	5,390	23,113	26.3	31,884	1,805	742	26.2	391	23.5	6,761	153	45.2
New York Central.....1935	122,699	64,807	187,506	21.4	34,353	2,063	840	26.7	386	24.6	6,648	117	62.6
1934	133,493	49,840	183,333	19.6	33,623	2,034	835	26.5	346	21.8	5,800	117	54.1
N. Y., Chi. & St. Louis.....1935	7,339	7,410	14,749	5.4	34,073	1,940	733	23.1	718	50.0	6,329	105	86.1
1934	9,211	6,336	15,547	4.8	33,327	1,846	669	22.0	631	46.8	5,907	106	83.1
Pere Marquette .....1935	10,136	6,500	16,636	4.7	26,301	1,619	594	24.1	432	30.8	3,455	104	83.4
1934	12,223	4,920	17,143	3.3	25,564	1,518	587	25.4	347	23.1	2,831	108	67.8
Pittsburgh & Lake Erie.....1935	14,751	11,408	26,159	40.7	42,587	3,028	1,614	45.1	135	5.3	15,064	121	32.0
1934	16,914	9,280	26,194	49.9	42,762	3,108	1,645	43.6	117	4.8	13,143	116	27.2
Wabash .....1935	11,709	8,968	20,677	3.2	35,085	1,749	591	20.3	518	41.5	4,400	130	59.7
1934	14,497	8,082	22,579	3.0	34,484	1,700	556	19.9	426	35.0	3,947	128	54.2
Central Eastern Region:													
Baltimore & Ohio.....1935	70,414	20,668	91,082	19.0	24,967	1,922	857	31.2	404	21.5	5,824	164	44.6
1934	78,793	16,430	95,223	19.3	24,906	1,894	829	30.4	345	19.2	5,198	164	39.9
Central of New Jersey.....1935	12,461	8,994	21,455	35.0	27,185	2,265	1,087	33.9	234	11.7	7,380	156	40.8
1934	14,542	8,150	22,692	30.7	28,775	2,348	1,121	34.4	222	11.3	7,330	149	36.8
Chicago & Eastern Illinois...1935	3,228	3,821	7,049	7.3	27,412	1,562	699	30.1	568	30.2	4,300	144	52.7
1934	3,984	2,502	6,486	10.5	25,709	1,474	655	31.1	563	29.9	3,890	135	52.4
Elgin, Joliet & Eastern.....1935	8,099	4,020	12,119	4.6	16,195	1,838	910	39.6	227	9.8	6,338	134	35.8
1934	8,740	2,691	11,431	18.6	15,463	1,693	823	39.3	188	8.3	4,817	138	30.3
Long Island .....1935	716	3,219	3,935	1.9	5,354	716	283	32.0	65	4.1	649	362	28.7
1934	777	3,194	3,971	3.9	5,819	719	299	31.6	74	4.4	753	334	24.4
Pennsylvania System .....1935	212,076	53,325	265,401	16.9	31,934	2,266	1,010	30.5	332	17.8	8,816	136	45.6
1934	241,838	42,161	283,999	13.7	31,797	2,280	1,006	29.9	271	14.9	7,687	135	39.1
Reading .....1935	28,861	10,032	38,893	10.0	25,382	1,986	948	35.4	318	15.2	8,511	160	45.5
1934	33,603	8,568	42,171	8.1	26,368	2,068	998	36.2	297	14.1	8,626	161	41.4
Pocahontas Region:													
Chesapeake & Ohio.....1935	39,385	9,936	49,321	2.1	46,740	3,408	1,824	45.8	939	37.9	15,183	93	56.7
1934	42,934	7,251	50,185	1.8	46,394	3,337	1,797	46.0	863	33.8	14,068	88	49.6
Norfolk & Western.....1935	34,056	4,814	38,870	2.4	45,178	3,081	1,624	43.5	799	31.2	14,479	122	57.6
1934	37,576	3,640	41,216	2.8	42,853	2,850	1,508	42.2	627	24.8	11,936	123	47.3
Southern Region:													
Atlantic Coast Line.....1935	23,337	7,903	31,240	19.9	18,689	1,081	362	18.4	195	17.7	1,184	125	43.6
1934	26,677	6,403	33,080	15.7	18,443	1,055	347	18.1	177	16.5	1,137	130	37.9
Central of Georgia.....1935	5,563	2,783	8,346	18.0	20,900	1,140	438	21.6	376	26.0	1,665	142	56.7
1934	7,092	1,964	9,056	27.1	21,050	1,124	416	20.9	307	22.0	1,474	139	47.9
Illinois Central (incl. Y. & M. V.).....1935	42,707	18,136	60,843	33.9	25,555	1,508	624	27.9	484	29.0	4,479	148	56.5
1934	51,237	13,700	64,937	40.6	25,234	1,500	625	28.7	431	25.5	4,252	150	49.4
Louisville & Nashville.....1935	38,923	8,565	47,488	25.1	23,247	1,521	733	34.6	517	25.4	4,905	148	65.4
1934	47,475	6,414	53,889	33.6	22,690	1,435	683	33.5	376	18.8	4,015	158	55.9
Seaboard Air Line.....1935	10,657	5,946	16,603	3.7	22,938	1,382	514	21.7	446	31.5	1,723	132	55.0
1934	12,236	5,091	17,327	6.1	22,308	1,354	469	20.5	391	30.8	1,576	130	54.6
Southern .....1935	26,459	16,834	43,293	18.1	20,201	1,213	468	22.3	402	28.2	2,635	166	46.9
1934	28,105	13,198	41,303	14.3	20,196	1,217	465	22.3	376	26.9	2,356	164	40.5
Northwestern Region:													
Chi. & North Western.....1935	39,790	19,152	58,942	8.4	23,727	1,578	566	22.5	274	19.9	1,935	143	39.7
1934	44,131	19,239	63,370	13.4	22,497	1,515	511	21.0	216	16.6	1,623	149	35.0
Chicago Great Western.....1935	2,172	3,390	5,562	2.8	33,146	1,765	608	21.9	812	63.9	3,099	141	79.9
1934	2,932	2,938	5,870	3.1	31,132	1,730	594	22.3	743	58.6	2,994	150	76.5
Chi., Milw., St. P. & Pac.....1935	47,805	17,187	64,992	2.9	25,649	1,595	626	25.6	378	25.1	2,208	137	64.5
1934	54,145	14,752	68,897	3.3	23,349	1,493	586	25.4	319	21.4	1,968	140	54.3
Chi., St. P., Minneap. & Om.1935	4,007	4,976	8,983	9.5	18,231	1,337	507	24.5	386	26.1	2,110	136	51.8
1934	2,031	6,818	8,849	10.6	17,148	1,231	487	25.1	356	23.4	1,918	144	44.8
Great Northern .....1935	38,825	10,287	49,112	7.2	28,529	1,847	777	26.0	334	19.8	1,992	136	36.5
1934	42,492	10,488	52,980	5.8	26,323	1,740	695	24.3	276	17.5	1,762	147	36.4
Minneap., St. P. & S. St. M.1935	13,095	3,921	17,016	4.1	19,648	1,205	503	23.8	320	20.0	1,272	120	74.5
1934	14,660	3,137	17,797	5.9	17,278	1,101	427	22.2	262	18.9	1,089	132	71.7
Northern Pacific .....1935	30,296	8,335	38,631	9.8	26,743	1,717	745	25.4	389	22.3	2,187	168	48.6
1934	34,840	4,542	39,382	10.1	25,192	1,658	687	24.2	300	18.4	1,842	178	44.8
Oreg.-Wash. R. R. & Nav.1935	6,589	2,492	9,081	3.8	23,608	1,491	598	24.3	361	22.3	1,564	160	47.7
1934	7,062	1,703	8,765	7.8	21,659	1,288	510	23.2	297	18.6	1,227	166	43.9
Central Western Region:													
Alton .....1935	2,575	6,588	9,163	22.7	31,005	1,328	518	25.9	354	22.9	3,498	145	70.5
1934	3,235	6,028	9,263	26.9	29,663	1,323	467	23.3	277	20.6	2,781	138	63.1
Atch., Top. & S. Fe (incl. G.C. & S.F. & P. & S.F.).....1935	70,727												

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Few railroads have sufficient volume in tonnage to justify the purchase of the equipment needed to rework and heat treat old springs and make them equal to new. Few shops can keep workmen so busy on springs that they become really expert. Only a big spring organization can perform research work and advance with the art of spring making.

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